

FEDERATED MALAY STATES.

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ANNUAL REPORT

OF THE

MEDICAL DEPARTMENT

FOR THE YEAR

1927

BY

DR. R. DOWDEN,  
*Principal Medical Officer, F.M.S.*

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KUALA LUMPUR:

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## ANNUAL REPORT OF THE MEDICAL DEPARTMENT FOR THE YEAR ENDING 31ST DECEMBER, 1927.

### ADMINISTRATION.

#### STAFF.

1. The total authorised staff of the Medical Department, Federated Malay States, including all branches, on the 31st December, 1927, was 1,138. It is divided as follows:

Hospital Branch	...	...	...	...	...	...	892
Health Branch	...	...	...	...	...	...	134
Institute for Medical Research	...	...	...	...	...	...	39
Central Mental Hospital	...	...	...	...	...	...	27
Veterinary Branch	...	...	...	...	...	...	32
Venereal Disease Branch	...	...	...	...	...	...	8
Radiological Branch	...	...	...	...	...	...	6
							Total ... 1,138

2. The following were the principal changes which took place during the year:

Dr. A. R. Wellington, Senior Health Officer, Federated Malay States, commenced his long leave from 14th February, 1927, but he left the State on 24th November, 1926, in order to attend a Medical Conference in Australia and after that to spend some time in Panama investigating medical problems there. Dr. A. K. Cosgrave, Senior Medical Officer, Selangor, acted as Senior Health Officer, Federated Malay States, until the return of Dr. Wellington on 12th October, 1927.

Title of Senior Health Officer was changed to that of Chief Health Officer, Federated Malay States, and three new appointments of Senior Health Officer, Perak, Selangor and Pahang and Negri Sembilan were created, all with effect from 19th February, 1927.

Dr. A. K. Cosgrave, Senior Medical Officer, Selangor, was promoted to the new appointment of Senior Health Officer, Selangor and Pahang, on 19th February, 1927.

Dr. F. R. Sayers, Senior Health Officer, Penang, was promoted to the new appointment of Senior Health Officer, Perak, on 19th February, 1927.

Dr. E. H. Black, Health Officer, acted as Senior Health Officer, Negri Sembilan, from 24th October, 1927, until the end of the year.

Dr. W. H. Hart, Senior Medical Officer, Pahang, acted as Senior Medical Officer, Selangor, from 1st January, 1927, to 24th August, 1927, on the transfer of Dr. A. K. Cosgrave to act as Senior Health Officer, Federated Malay States, and as Senior Medical Officer, Perak, from 25th August, 1927, until the end of the year on the retirement of Dr. F. E. Wood on pension.

Dr. H. G. Holdbrook, Chief Medical Officer, Malacca, acted as Senior Medical Officer, Selangor, from 19th August, 1927, until the end of the year.

Dr. C. E. Cobb, Medical Officer, acted as Senior Medical Officer, Negri Sembilan, from 1st July, 1927, until the end of the year during the absence of Dr. D. T. Skeen.

Dr. H. R. Dive, Medical Officer, continued to act as Senior Medical Officer, Pahang, during the year.

Dr. E. A. Smith was confirmed in the appointment of Specialist on Venereal Diseases as from 1st June, 1924.

Dr. A. N. Kingsbury, Bacteriologist, Institute for Medical Research, acted as Director, Institute for Medical Research, from 5th August, 1927, and was permanently appointed on 14th October, 1927, on the retirement of Dr. W. Fletcher on pension.

Dr. R. Lewthwaite, Research Student in Tropical Medicine, acted as Malaria Research Officer from 22nd June, 1927, to 21st September, 1927, during the absence on leave of Mr. B. A. R. Gater.

Mr. H. Marsden, Chemist, acted as Chief Chemist from 23rd November, 1927, until the end of the year during the absence on leave of Mr. R. W. Blair.

## APPOINTMENTS.

3. During the year, the following officers were appointed:

- Dr. R. T. B. Green as Pathologist II, Institute for Medical Research, on 27th March, 1926.  
 Mr. G. B. Purvis as Veterinary Surgeon on 11th February, 1927.  
 Dr. M. P. O'Connor as Medical Officer on 25th February, 1927.  
 Mr. R. W. Blair as Chief Chemist, Institute for Medical Research, on 25th March, 1927.  
 Dr. F. L. Patterson as Medical Officer on 25th March, 1927.  
 Mr. J. R. G. Young as European Male Attendant, Central Mental Hospital, on 2nd June, 1927.  
 Mrs. J. R. G. Young as European Female Attendant, Central Mental Hospital, on 2nd June, 1927.  
 Dr. R. G. Keays as Medical Officer on 28th July, 1927.  
 Dr. C. P. Allen as Anaesthetist on 28th July, 1927.  
 Mr. W. R. Wallace as Veterinary Surgeon on 28th July, 1927.  
 Dr. G. A. Dunlop as Medical Officer on 12th August, 1927.  
 Dr. H. N. Nevin as Medical Officer on 12th August, 1927.  
 Dr. R. A. Pallister as Medical Officer on 25th August, 1927.  
 Dr. F. G. Greenwood as Radiologist II on 1st September, 1927.  
 Dr. H. O. Hopkins as Malaria Research Officer on 9th September, 1927.  
 Mr. I. A. Simpson as Chemist on 7th October, 1927.  
 Mr. T. J. Wimsey as European Male Attendant, Central Mental Hospital, on 4th November, 1927.  
 Mr. J. Smith as European Male Attendant, Central Mental Hospital, on 4th November, 1927.  
 Dr. C. T. Macarthy as Medical Officer on 30th December, 1927.  
 Dr. (Mrs.) E. C. Chitty as Temporary Lady Medical Officer on 17th January, 1927.  
 Dr. (Miss) H. I. Robertson as Lady Medical Officer on 10th March, 1927.  
 Dr. (Miss) W. H. Mitchell as Lady Medical Officer on 25th March, 1927.  
 Dr. (Miss) M. A. Minahan as Temporary Lady Medical Officer on 30th April, 1927.  
 Dr. (Mrs.) I. M. Dunlop as Lady Medical Officer on 12th August, 1927.  
 Dr. (Mrs.) M. E. Hopkins as Temporary Lady Medical Officer on 1st November, 1927.

## RETIREMENTS.

- Dr. D. M. Ford retired on pension on 20th August, 1927.  
 Dr. W. Fletcher retired on pension on 14th October, 1927.  
 Dr. F. E. Wood retired on pension on 25th November, 1927.

## RESIGNATIONS.

- Dr. B. D. Merrin, Medical Officer, resigned on 22nd April, 1927.  
 Dr. (Mrs.) M. H. White, Temporary Lady Medical Officer, resigned on 30th May, 1927.

## DEATH.

I regret to record the death of Dr. P. G. Temple, on 24th January, 1927, while on leave in England.

## ASSISTANT SURGEONS.

## APPOINTMENTS.

The following Assistant Surgeons were appointed during 1927:

- Mr. R. S. Dhillon, Assistant Surgeon, on 21st February, 1927.  
 Mr. K. Murugesu, Assistant Surgeon, on 4th April, 1927.  
 Mr. S. Kanapathipillai, Assistant Surgeon, on 4th April, 1927.  
 Mr. W. S. Poulier, Assistant Surgeon, on 6th April, 1927.  
 Mr. G. L. Gune, Assistant Surgeon, on 3rd May, 1927.  
 Mr. S. Ramamirtham, Assistant Surgeon, on 13th July, 1927.  
 Mr. A. G. Menon, Assistant Surgeon, on 26th August, 1927.  
 Mr. N. Gopalapillai, Assistant Surgeon, on 1st September, 1927.



Mr. F. Koland, Assistant Surgeon, on 17th September, 1927.  
 Mr. S. Venkatachalam, Assistant Surgeon, on 14th October, 1927.  
 Mr. S. Rao R. Savoor, Assistant Surgeon, on 16th November, 1927.  
 Mr. R. K. Thirupad, Assistant Surgeon, on 16th November, 1927.  
 Mr. P. K. Parasurama Iyer, Assistant Surgeon, on 25th November, 1927.  
 Mr. Ram L. Milhotra, Assistant Surgeon, on 5th December, 1927.  
 Mr. V. R. N. Menon, Assistant Surgeon, on 12th December, 1927.

## RESIGNATIONS.

Mr. Thiam Hock Wee resigned on 27th March, 1927.  
 Mr. M. K. Lukshumyah, Assistant Surgeon, resigned on 12th April, 1927.  
 Mr. J. S. Goonting, Assistant Surgeon, resigned on 1st August, 1927.  
 Mr. M. A. Gabriel, Assistant Surgeon, resigned on 30th September, 1927.

## NURSING SISTERS.

4.—

## APPOINTMENTS.

Miss M. O'Sullivan, Nursing Sister, on 14th January, 1927.  
 Miss F. Macdonald, Nursing Sister, on 25th February, 1927.  
 Miss H. Killoran, Nursing Sister, on 25th March, 1927.  
 Miss M. Mooreby, Nursing Sister, on 22nd April, 1927.  
 Miss J. Williams, Nursing Sister, on 22nd April, 1927.  
 Miss M. Culleton, Nursing Sister, on 22nd April, 1927.  
 Miss H. Grandison, Nursing Sister, on 22nd April, 1927.  
 Miss W. O. Nursaw, Nursing Sister, on 23rd April, 1927.  
 Miss K. Matthews, Nursing Sister, on 23rd April, 1927.  
 Miss K. M. Fosdike, Nursing Sister, on 23rd April, 1927.  
 Miss M. Winton, Nursing Sister, on 5th May, 1927.  
 Miss V. E. M. Hunt, Nursing Sister, on 5th May, 1927.  
 Miss E. Wood, Nursing Sister, on 5th May, 1927.  
 Miss C. A. Harness, Nursing Sister, on 5th May, 1927.  
 Miss N. M. Jones, Nursing Sister, on 20th May, 1927.  
 Miss V. Pepper, Nursing Sister, on 20th May, 1927.  
 Miss L. G. Culleton, Nursing Sister, on 2nd June, 1927.  
 Miss D. M. Clarke, Nursing Sister, on 2nd June, 1927.  
 Miss H. N. Shambrook, Nursing Sister, on 2nd June, 1927.  
 Miss G. Rabone, Nursing Sister, on 2nd June, 1927.  
 Miss E. L. Burbridge, Nursing Sister, on 15th July, 1927.  
 Miss L. Parsons, Nursing Sister, on 15th July, 1927.  
 Miss J. D. Leggatt, Nursing Sister, on 26th July, 1927.  
 Miss E. L. James, Nursing Sister, on 12th August, 1927.  
 Miss E. James, Nursing Sister, on 9th September, 1927.  
 Miss M. Doyle, Nursing Sister, on 15th December, 1927.  
 Miss M. Wardell, Nursing Sister, on 31st December, 1927.

## PROMOTION.

Miss A. Boyd, Nursing Sister, promoted to Matron Grade II on 1st January, 1927.

## RETIREMENT.

Miss H. H. Theobald, Nursing Sister, retired on pension on 25th May, 1927.

## RESIGNATIONS AND DISMISSALS.

Miss E. Nicholson, Nursing Sister, resigned on 9th March, 1927.  
 Miss W. C. Chapman, Nursing Sister, engagement expired on 29th March, 1927.  
 Miss C. S. W. Brown, Nursing Sister, engagement expired on 9th April, 1927.  
 Miss B. T. Sparks, Nursing Sister, engagement expired on 8th April, 1927.  
 Miss M. I. Teale, Nursing Sister, resigned on 7th June, 1927.  
 Miss G. Rabone, Nursing Sister, resigned on 12th November, 1927.  
 Miss L. M. Midgley, Nursing Sister, resigned on 16th December, 1927.  
 Miss E. G. Hill, Nursing Sister, dismissed on 3rd March, 1927.  
 Miss A. D. Chappel, Nursing Sister, resigned on 9th May, 1927.

## ENACTMENTS.

5. No Enactment affecting public health was passed during the year 1927 but the following rules under the Labour Code and the Sanitary Boards Enactment were passed.

Rules, to provide:

- (a) for the safe custody of medicines where, for the sake of convenience, kept in any place outside a hospital or recognised dispensary;
  - (b) for the administering of medicines by the Dresser in charge or responsible person approved by the Medical authorities; and
  - (c) the definition of a Dresser
- were made under "The Labour Code, 1923."

The following new by-law under "The Sanitary Boards Enactment, 1916," was passed:

The occupier of any land or premises, and in the case of unoccupied land or premises, the owner thereof, shall keep such land or premises in such a state as not to be a nuisance, or offensive, or an annoyance to any persons living in the neighbourhood, and in such a state as not to cause or to be likely to cause danger or be prejudicial to health or to favour of the existence or propagation of mosquitoes and in particular he shall

- (a) prevent the accumulation anywhere therein of dead vegetable matter, manure, refuse or of any other noxious or unsightly matter;
- (b) keep down the growth of useless vegetation therein;
- (c) keep the said land or premises clear of empty tins, coconut shells, or other disused or unused matter or receptacles capable of retaining water and prevent the accumulation of such matters or receptacles except in a place suitable for disposal and in such manner that they are not liable to retain water;
- (d) prevent the formation anywhere therein of pools of waste or stagnant water or sullage and prevent the making of any excavation on the said land likely to retain water without the previous permission of the Board in writing;
- (e) keep clean any cistern, water butt or other receptacles used for the storage of water and keep the same covered or protected in such manner as to prevent the breeding of mosquitoes therein;
- (f) maintain in good repair any fence or hedge bordering upon a public thoroughfare, and at any time when so ordered by the Board in writing, repair any such fence or hedge or remove any tree overhanging a public thoroughfare or trim, prune or cut any such tree or hedge to such an extent and in such manner and within such time as may be specified in the order.

## FINANCIAL.

- 6. (a) Statement of Revenue for the year 1927—  
Revenue (Hospital fees, licences, etc.) ... \$ 437,737.51
- (b) Statement of Expenditure for the year 1927—  
Personal Emoluments and Other Charges ... 5,404,421.17
- (c) The Estimated Revenue for the Federated Malay  
States for the year 1927 ... ... 82,539,263.00

## PUBLIC HEALTH.

## (a).--GENERAL REMARKS.

7. The general health of the country was not satisfactory during the year under review, the death-rate being 32.11 per mille as against 29.22 per mille for the previous year and 23.60 per mille for the year 1925.

The increase in the death-rate was most marked in the State of Pahang, where it increased from 25.03 per mille in 1925 to 43.32 per mille in 1927. Records of 1926 lost in floods. The upward trend of the death-rate since 1925 which was the lowest on record may be accounted for by the influx of very large numbers of immigrants and their dependents who were not acclimatised and who are frequently of a poor physique. This is partly borne out by the increased death-rate amongst hospital patients. The fact that the mortality rate in such diseases as dysentery and diarrhoea, pulmonary tuberculosis, pneumonia, etc., appears to indicate a lowered resistance on the part of the population. The outbreaks of cholera, plague and smallpox and beri-beri which occurred during the year contributed to the increased death-rate.



There is little doubt that the increase in the State of Pahang was largely due to the lowered vitality of the population resulting from the floods which occurred at the end of 1926 and in January, 1927, and by the destruction of vegetable gardens and padi crops causing an outbreak of beri-beri. Malarial fever due to seepage and residual water following the floods also caused many deaths. Every effort was made by the Health and Hospital Branches to deal with these effects of the floods, and the Institute for Medical Research issued large quantities of rice polishings extract, but it was impossible to control these diseases over large tracts of unopened country with communications broken down. The outbreak of beri-beri proves how very narrow the margin is amongst Asiatics between health and disease, and also how they immediately react to any interference with the vitamin contents of their food supplies.

In spite of all that can be done the population of all races are using more and more polished rice. It is easier to obtain, more pleasant to eat, and more easily cooked than the other forms of rice which either require husking before use, or when cooked are unpleasant both in taste and appearance to many people.

(b).—COMMUNICABLE DISEASES.

8. *Malaria*.—The total number of deaths attributable to fevers, most of these probably malarial, was 20,736, an increase of 4,205 over those for 1926. There were 49,452 cases treated in hospitals with 2,543 deaths and a death-rate of 5.13 as compared with 38,633 cases with 1,792 deaths and a death-rate of 4.64 for the year 1926 and 23,056 with 993 deaths in 1925. The year under review was like 1926 a bad malarial year. The raising of the normal subsoil water level throughout the country due to abnormal floods at the end of 1926 and early 1927 thereby increasing the number of mosquito-breeding places and consequently the mosquito population, was probably the chief cause for this increase. An increase in the incidence of malaria was noted to follow a period of exceedingly heavy rainfall. Reports from the various hospitals seem to show that the type of case was rather more severe.

The distribution of quinine was actively carried out, Health Officers were specially warned to watch for new mosquito breeding places, and the Health Branch took all possible measures to cope with the prevailing conditions, but these were so universal and widespread that complete success was hardly possible, and all that could be done was to control the outbreak which but for the efforts of the staff would have been far worse. Similar conditions seem to have caused a widespread outbreak of malaria in Kenya Colony at about the same time of year.

Plasmoquine has been tried in this country and the results are similar to those recorded elsewhere. In a few cases the effect upon the patients was rather alarming and it does not appear to be suitable for general use of distribution.

9. *Blackwater Fever*.—There were eight cases of blackwater fever with three deaths. They were distributed as follows:

States.							Cases.		Deaths.	
Perak	...	...	...	...	...	...	—	...	—	...
Selangor	...	...	...	...	...	...	1	...	—	...
Negri Sembilan	...	...	...	...	...	...	4	...	1	...
Pahang	...	...	...	...	...	...	3	...	2	...
Total							8	...	3	...

During an experience extending over many years in this country *Plasmodium falciparum* has been found in the blood of every case of blackwater fever if examined within forty-eight hours of onset. In only one case of blackwater fever was *P. vivax* ever seen.

10. *Dysentery and Diarrhoea*.—The total number of cases treated in hospitals was 6,857 with 1,605 deaths and a death-rate of 23.40 per mille as against 6,254 with 1,149 deaths and a death-rate of 18.37 for 1926. The types were as follows:

States.			Amoebic.			Deaths.			Bacillary.			Deaths.			Diarrhoea.			Deaths.		
Perak	...	...	1,076	...	198	...	880	...	278	...	1,334	...	185	...	...	...	...	...	...	...
Selangor	...	...	285	...	77	...	739	...	337	...	865	...	130	...	...	...	...	...	...	...
Negri Sembilan	...	...	364	...	88	...	450	...	159	...	345	...	27	...	...	...	...	...	...	...
Pahang	...	...	80	...	10	...	337	...	77	...	102	...	39	...	...	...	...	...	...	...
Total			1,805	...	373	...	2,406	...	851	...	2,646	...	381	...	...	...	...	...	...	...

The number of cases treated shows an increase of 603 over that of 1926 but the death-rate is 5.03 per mille higher. The increased death-rate is, as already stated, probably due to the lowered vitality of the population and flood conditions.

Bacteriophage appears to be ineffective in *Flexner* dysentery infections, but effective in *Shiga* cases, unfortunately this is the more uncommon cause of bacillary dysentery in the Federated Malay States.

The Government's and department's thanks are due to Dr. d'Herelle who visited and gave every assistance in his power. Investigation is being continued.

11. *Venereal Diseases*.—The total number of cases treated in hospitals during the year was 5,236 with 74 deaths and a death-rate of 1.41 per mille as compared with 4,428 cases with 51 deaths and a death-rate of 1.15 for the previous year. In addition, 20,508 cases were treated in Clinics and treatment centres.

As in the previous year, considerable progress has again been made in combating venereal diseases, new treatment centres have been opened, which are well attended, and there has been an increase of attendance at the old centres.

This satisfactory progress can be attributed to the propaganda work which has been carried out, and to the careful selection and special training given by the Venereal Disease Specialist to the staff who have been appointed to the different Clinics.

Injections of arsenical compounds are given at all hospitals and dispensaries. The following are the figures for the different States:

States.	1925.	1926.	1927.
Perak ... ..	15,913	11,863	12,466
Selangor ... ..	10,525	9,581	4,845
Negri Sembilan ... ..	3,244	3,091	2,780
Pahang ... ..	2,068	2,984	1,528
Total ... ..	31,750	27,519	21,619

The report of Dr. Smith, Specialist, Venereal Diseases, is attached as Appendix (J).

A reference must be made to page 120 of the Venereal Disease Specialist's Report and to page 101 of the Medical Superintendent Central Mental Hospital's Report in which the decrease of general paralysis of the insane cases in the Mental Hospital is recorded. From this it would appear that the excellent work of the Venereal Disease Specialist during the past five years is bearing fruit.

12. *Pulmonary Tuberculosis*.—The number of cases treated in hospitals during the year under review was 2,413 with 1,118 deaths and a death-rate of 46.33 per mille as compared with 2,329 cases with 995 deaths and a death-rate of 42.72 per mille for the year 1926. The number of fatal cases remains high but is not alarming when it is realised that in the majority of cases patients only come into hospital to die. Extensive propaganda in the form of pamphlets and posters was continued by the Public Health Education Committee.

The conditions here are unsuitable to sanatorium treatment, but special wards for this disease will be erected at the Decrepit Settlement at Sungei Buloh, now in the course of erection. Overcrowding in the towns and the sanitary conditions of the town houses have not yet been dealt with satisfactorily in spite of Government's assistance.

13. *Yaws*.—The treatment of yaws by arsenical compounds was continued. A total number of 24,078 injections were given during the period under review. The number of cases treated in each State in comparison with the number treated in 1924, 1925 and 1926 is shown in the following table:

States.	1924.	1925.	1926.	1927.
Perak ... ..	9,884	9,155	9,358	2,307
Selangor ... ..	2,231	1,305	1,680	2,504
Negri Sembilan ... ..	7,267	6,426	4,543	4,465
Pahang ... ..	3,997	9,403	7,893	3,913
Total ... ..	23,379	26,289	23,474	13,189



The campaign against this disease was carried on as usual but though the Malays, who form the vast majority of those affected, are very keen on the treatment, yet they still cannot be persuaded to continue treatment after the outward and visible signs of the disease have disappeared. The decrease in the number of cases treated is very largely due to the work of the travelling dispensaries in the more accessible areas. There is probably an untapped area amongst the population on the Perak and Pahang rivers. This is gradually being dealt with by the travelling dispensary motor launches. The boundaries of the Unfederated Malay States contiguous with those of the Federated Malay States need carefully watching to detect the entrance of infected persons and the establishment of fresh foci of disease.

14. *Leprosy*.—There were 480 fresh admissions and 80 deaths from this disease during the year.

There were 104 self-diagnosed cases who voluntarily sought admission to the Kuala Lumpur Leper Asylum. In 1926, 72 cases similarly sought admission. During the past two years this has been granted when the diagnosis of leprosy has been confirmed by the Medical Officer on clinical and bacteriological grounds as the later lesions of syphilis and leprosy are occasionally somewhat similar and have been confused, especially by the Chinese.

The large proportion of admissions (46 per cent.) who have of their own accord come to the Asylum during the year is regarded as significant of an increased knowledge among the Asiatic population concerning leprosy and of the advantages of persuading or compelling lepers resident in their midst to go to an asylum. It would also appear to be indicated of the appreciation by lepers living outside, of the fact that despite segregation, their disease will be treated and that they will be well looked after within the Asylum.

In addition, a large proportion of the lepers at present seeking admission, or sent by hospitals, are in the early stages of the disease. Previously, the Asylum was sought as a last resort by the far advanced lepers mostly, these often being horribly mutilated and mostly very infective. In these cases the relatives had grown tired of concealing them and looking after them.

Illustrated and other pamphlets on leprosy were widely distributed by the Committee for Public Health Education during the year.

The good work, both administrative and curative, of the Medical Officer in charge deserves special recognition. The latest forms of treatment are being carried out and special investigations into the disease are in the hands of the Institute for Medical Research.

A new Federal Leper Settlement is in the course of erection at Sungei Buloh.

15. *Cancer*.—An investigation into the incidence of cancer among the inhabitants of Malaya is being carried out at the Institute for Medical Research at the request of the Ministry of Health. Statistics are being collected, and a report will be issued in due course. A list giving details of the malignant tumours diagnosed histologically during the year is given in Table XIV of the Institute for Medical Research Report.

#### INFECTIOUS DISEASES.

16. *Cholera*.—One hundred and fourteen cases of cholera occurred in Perak with 74 deaths. There were three distinct outbreaks, the first occurring early in June on estates in the Batang Padang area of Lower Perak, and at Sitiawan. A further outbreak occurred in Perak North in July and the most serious outbreak commenced on 18th August, 1927, and lasted for three weeks. In this outbreak on the Perak River between Parit and Teluk Anson there were 57 cases and 40 deaths. Anti-cholera vaccination was carried out in as wholesale a manner as possible in the infected areas, pamphlets giving warnings and instructions printed in the vernacular were lavishly distributed. The motor launch belonging to the Medical Department at Teluk Anson proved of great value in this outbreak, as many cases occurred in the riverine kampongs.

The disease was originally imported by carriers from India and the Health Branch deserves immense credit for its work on the river and the rubber estates.

During the last large epidemic in 1913 there were 1,000 known cases, and probably 2,000, along the river banks alone. In 1927 the figures speak for themselves.

17. *Plague*.—Thirty-three cases were reported with 39 deaths during the year. The majority of these cases occurred in and around Ipoh. One case occurred in Kuala Kangsar Hospital which had probably come from Ipoh. Another probable case occurred at Teluk Anson which was confirmed bacteriologically but also had arrived from the plague area in Ipoh. Several cases were also reported from Pusing in Perak. The general precautions which were taken included closing of houses or shops, complete segregation and vaccination of contacts and neighbours, disinfection of premises and clothes, daily examination of contacts and frequent inspections of the guards in order to prevent abscondings. How the first infection was introduced was not definitely established but it is thought extremely probable that infected fleas were imported with either Siamese or Indian rice. Anti-rat measures were carried out by trapping and poisoning and this is being continued. There was no rat mortality and only one rat trapped was found plague-infected. Clinical observations by the Medical Officer, Ipoh, tend to confirm the theory, proved by the writer in 1917, that rice and gunny bags imported the infected fleas. One gunny bag dealer developed a bubo in his right arm-pit.

Although intravenous iodine apparently failed to cure it is probable that the cases were not seen early enough, as in 1917 the writer had five successful cases amongst plague patients detected by house to house visits within 24-48 hours of the onset of the disease.

18. *Typhus Fever*.—Eighty-four cases of tropical typhus were diagnosed at the Institute for Medical Research during the year and they were distributed as follows:

States.	Cases.	Deaths.
Perak ... ..	54	14
Selangor ... ..	20	2
Negri Sembilan ... ..	5	1
Pahang ... ..	5	1
Total ... ..	84	18

The investigations into this disease continue at the Institute for Medical Research.

19. *Enteric Fever*.—There were 168 cases treated in hospitals with 26 deaths during the year as compared with 147 cases and 26 deaths for the corresponding period of 1926.

States.	Cases.	Deaths.
Perak ... ..	54	14
Selangor ... ..	82	4
Negri Sembilan ... ..	25	7
Pahang ... ..	7	1
Total ... ..	168	26

20. *Diphtheria*.—There were 47 cases diagnosed at the Institute for Medical Research during the year with 14 deaths.

21. *Influenza*.—Influenza has been on the increase during the year under review. There were 5,842 cases with 43 deaths as against 5,405 cases and 74 deaths in 1926. This disease was in a very mild form.

It no doubt tends to lower patients resistance to invasion by the tubercle bacillus.

22. *Pneumonia*.—The number of cases treated was 3,021 with 1,440 deaths and a death-rate of 47.67 as against 2,066 cases with 1,202 deaths and a death-rate of 45.09 for the year 1926. The greater number of deaths were amongst Tamil labourers.

Cases usually come into hospital in an advanced stage of the disease and this, combined with the peculiarly low resisting power of the Asiatic to this and other lung diseases, accounts for the high death-rate. This disease is assuming a large importance as a cause of death in this country. Many forms of treatment were tried but no specific cure was discovered.

23. *Smallpox*.—There were 237 cases with 24 deaths; 170 with four deaths in Selangor and 63 with 20 deaths in Negri Sembilan, Perak recorded three cases and Pahang one.



In Negri Sembilan the cases occurred in March, April and May. In Selangor, the Kuala Lumpur and Ulu Langat districts were chiefly affected, two epidemics occurring in May and August, but the disease was apparently of a much milder form comparable to Jamaican Alastium than the earlier outbreak in Negri Sembilan. Considerable difficulty was experienced in tracing out cases and contacts and keeping them from leaving infected areas. Prosecutions were made in several cases under the Quarantine and Prevention of Disease Enactment and heavy fines were inflicted in the Courts. Leaflets, giving details of these and assuring the public that it was to their own interest to report cases early and to assist the Government, were published in various languages and distributed in great numbers.

The number of vaccinations performed was 269,509 as compared with 113,914 performed last year. They were distributed as follows:

States.	1924.	1925.	1926.	1927.
Perak ... ..	54,278	86,125	88,539	106,865
Selangor ... ..	11,745	26,369	14,256	65,091
Negri Sembilan ... ..	6,563	8,268	5,392	64,639
Pahang ... ..	5,821	5,543	5,727	32,914
Total ... ..	78,407	126,305	113,914	269,509

Again the Health Branch are to be congratulated on their work. These incidences of the disease amongst vaccinated children drew attention to the fact that the Hong Kong lymph was not affording protection, and Java lymph was substituted with complete success. In 1929 the department hopes to prepare its own vaccine lymph.

24. *Beri-beri*.—The number of cases treated for this disease was 2,782 with 447 deaths and a death-rate of 16.07 as compared with 1,075 cases with 140 deaths and a death-rate of 13.02 for the corresponding period of 1926.

There was a very marked increase in the numbers of these cases treated in Pahang due to the exceptional conditions in the State resulting from the floods: the cases came chiefly from the railway construction areas north of Kuala Lipis and the mining areas in the Bentong, Raub and Kuantan districts. This increase showed that the Chinese of the manually working class who usually eat polished rice, have very slight reserves of anti-neutritic vitamin to call upon in emergency: the Malays who have taken to this custom were affected also; very few Tamils were admitted.

#### HELMINTHIC DISEASES.

25. *Ankylostomiasis*.—This is the chief helminthic disease from a health point of view. A total of 2,246 cases were treated in 1927 as compared with 2,493 cases in 1926. These figures are for cases who were treated for this disease only. At least 90 per cent. of the native population harbour the worm in small numbers but few show symptoms unless they are also suffering from a concurrent disease such as malaria or dysentery when the combination is a grave one. Ascariasis is also very common and though in the majority of cases is not of serious importance is sometimes responsible for acute intestinal trouble and for convulsions in children. Extensive propaganda by the Public Health Education Committee and at the Infant Welfare Centres was continued during the year.

The District Medical Officers conduct campaigns against these parasites but the population are very conservative in their sanitary ideas. The Chinese still continue manuring vegetables with night-soil and all fresh vegetables are dangerous.

A great deal of propaganda work has also been done.

#### (c).—VITAL STATISTICS.

26. Populations are estimated from the census figures which are believed to be correct. Immigration and emigration have a greater influence on population than have births and deaths. Accurate information concerning immigration and emigration, especially by rail, are not available and tables cannot be given.

Increase in population is calculated on the arithmetical increase basis as experience has shown this to be more reliable than that based on geometrical grounds.

Births and deaths figures are obtained from notifications compulsory under the Registration of Births and Deaths Enactment which is everywhere in force. The total number of births and deaths is approximately correct. The accuracy of diagnosis as to causes of deaths is in the majority of cases open to question, for few of the cases were seen by a qualified medical man previous to decease. In each of the four large towns every uncertified body is viewed by the Assistant Health Officer who interrogates the friends and forms a diagnosis. In rural districts these duties are carried out by the Police.



Deaths in towns are debited against the town only if the deceased was resident there for three months or more previous to death. The towns contain hospitals which cater both for the town and the district surrounding it. It is a well-known fact that chronic cases from the rural areas drift to the towns in the hope of getting more skilled treatment. Taking all things into consideration even with a qualifying period of three months, a number of deaths are debited against the towns which should be debited against the rural areas where the disease was contracted.

27. The general death-rate for the four States was 32.11 per mille as against 29.22 for the whole of the Federated Malay States (Pahang excluded) for 1926; this increase is probably due to malaria, the floods and the increased immigration not reckoned in the population, Chinese and Tamil.

The number of deaths attributable to fevers (most of them probably malaria) was 20,736 or 42.91 per cent. of the total. Last year the percentage was 43.

Dysentery and diarrhoea accounted for 7.15 per cent. of the total deaths, pulmonary tuberculosis for 4.16 per cent., pneumonia for 6.66 per cent. and convulsions for 11.08 per cent.

28. The following figures are put up for comparison, 1911 being the year the Health Branch was formed:

Year.	Federal.		Kuala Lumpur Town.		Estates.	
	General death-rate.	Fevers death-rate.	General death-rate.	Fevers death-rate.	General death-rate.	Fevers death-rate.
1911	39.11	17.47	39.02	9.87	62.90	Not known
1927	32.11	13.78	23.47	4.89	17.48	6.71

Few Asiatic-owned estates, especially the smaller ones, will admit the existence of sickness or the occurrence of a death, and nil returns are sent to the Health Officer, this tends to prevent these figures being as accurate as we would wish.

It is hoped that with the formation of Health Boards to exercise a closer supervision of these estates.

#### POPULATION.

29. The population of the Federated Malay States as estimated at the end of June, 1927, was 1,504,823, distributed as follows:

Perak	...	...	...	...	...	...	...	664,680
Selangor	...	...	...	...	...	...	...	467,868
Negri Sembilan	...	...	...	...	...	...	...	209,113
Pahang	...	...	...	...	...	...	...	163,162

30. Assuming that the races remain in the same proportion as in the census year, the race distribution is as follows:

States.	Europeans and Americans.		Eurasians.	Malays and other nationalities of the Archipelago.		Chinese.	Indians.	Others.
Perak	...	2,454	1,051	...	264,187	229,199	165,815	1,974
Selangor	...	3,166	1,809	...	108,559	183,049	169,094	2,191
Negri Sembilan	...	1,201	553	...	82,587	80,376	43,289	1,107
Pahang	...	367	138	...	111,726	40,235	9,990	706
Total	...	7,188	3,551	...	567,059	532,859	388,188	5,978

#### BIRTHS.

31. Forty-eight thousand and thirteen births were registered during the year, giving a birth-rate of 31.91 per mille of population as against 39,834 births and a birth-rate of 30.28 in 1926. The following table shows the number of births and birth-rates according to races:

Race.	No. of births.	Birth-rate.
Europeans and Americans	119	16.56
Eurasians	106	29.85
Malays and other races of the Archipelago	20,814	36.71
Chinese	16,652	31.25
Indians	10,244	26.39
Others	78	13.05

## DEATHS.

32. Forty-eight thousand three hundred and twenty-three deaths were registered, giving a death-rate of 32.11 per mille. The number of deaths in 1926 was 38,445 and the rate was 29.22.

## INFANT MORTALITY.

33. The number of deaths of children under one year was 9,752 or an infantile mortality rate per thousand births of 203.11 against a mortality rate of 193.75 in 1926. The death-rates for the four States were:

States.	Deaths of children under one year.	Death-rate per 1,000 births.
Perak ... ..	3,687	181.33
Selangor ... ..	3,018	189.91
Negri Sembilan ... ..	1,448	229.62
Pahang ... ..	1,599	291.68
Total ...	9,752	203.11

## (d).—GENERAL EUROPEAN POPULATION.

34. The general health of the European population was good, but there was an increase in sickness. The total European and American population as estimated at the end of December, 1927, was 7,188. There were 119 births, giving a birth-rate of 16.56 per mille, and 35 deaths with a death-rate of 4.87 per mille as compared with a birth-rate of 19.86 per mille and a death-rate of 5.46 per mille for the previous year.

## SANITATION.

35. The Health Branch is still understaffed but it is hoped to considerably augment the number of Health Officers next year when a number of new qualified men are expected to arrive. The change of title of the Senior Health Officer to that of Chief Health Officer and the creation of three senior posts of Senior Health Officers, Perak, Selangor and Pahang, and Negri Sembilan has supplied a long felt want.

The sending of Asiatic Sanitary Inspectors to Singapore to undergo a course for the Royal Sanitary Institute certificate was continued during the year and four passed successfully and gained the certificate.

The work in connection with the opening up of the Cameron's Highlands has thrown a great deal of work on the Medical and Health Branches of the Department. Every effort is being made to keep the road leading up to the Highlands and the Highlands themselves free from disease, especially from malaria, by the examination of all labourers in Tapah prior to their engagement but great difficulty has been encountered in this direction as it is very difficult to control efficiently all the contractors to prevent their engaging labourers who have not been previously examined.

## INSPECTION OF SCHOOLS.

36. The inspection of schools is still being carried out by both the Medical and Health Branches of the Department. Practically every school was inspected at least once during the year, particularly so in Selangor where the schools which are on the itinerary of the travelling dispensaries are visited more frequently than once a month and treatment given for all minor ailments. The general sanitation and water supply of the schools in the rural areas is, in a great number of cases, very poor.

Towards the end of the year a Lady Medical Officer with considerable experience in school work was specially detailed for the inspection of girls' schools.

The inspections were carried out on the same lines as the Routine Medical Inspection of school children in England, special attention being given to examination for conditions common in the tropics. Special printed cards were designed and the condition of each child was recorded on a separate card.

It is hoped that when the Medical Inspectors of Schools have been appointed, to be able to extend this systematic inspection of school children to all schools in the Federated Malay States. Four Medical Inspectors of Schools have been approved for 1928.



## PUBLIC HEALTH EDUCATION.

37. The Public Health Committee met on several occasions during the year; at Horticultural Shows exhibitions were put up which were well attended, lectures were given and pamphlets which had been prepared by the Committee were distributed in large numbers in various languages.

At the Malayan Exhibition held in Kuala Lumpur from the 29th July, 1927, to 1st August, 1927, both dates inclusive, exhibits on anti-malaria measures and other public health subjects were put up by the Malaria Advisory Board in conjunction with the Committee for Public Health Education, the Infant Welfare Advisory Board, the Institute for Medical Research and the Specialist in Venereal Diseases. The Acting Malaria Research Officer and his staff spent considerable time on these exhibits and supplied a good deal of the material.

The exhibits were housed in a large building forming two sides of a square, one side being wholly taken up by the Infant Welfare exhibit and the other by exhibits on malaria, social hygiene, beri-beri, Japanese river fever, anti-rabic treatment, hook-worm, trachoma, yaws and general public health matters. Officers of the various branches were in attendance to explain the various exhibits and answer the great number of questions which were asked.

The malaria exhibit, which occupied the major portion of the Medical Health Section, was comprised of exhibits of (a) living specimens of both anopheline and culicine larvae, and water insects destructive to them, as well as larvae-eating fish. The destructive powers of both fish and insects were demonstrated at frequent intervals. These attracted a great deal of interest. (b) Mounted specimens of Malayan anophelines (larvae and adults) and copies of drawings of anophelines by well-known authorities were displayed. Microscopes were available to enable visitors to examine more closely the distinguishing features of the various anopheline larvae. (c) The method of reducing malaria by drainage was demonstrated by a large number of photographs and by models of ravines, one model illustrating a ravine in nature with subsoil water seeping at the hill-foots and the other showing the position of subsoil pipes was exhibited. The effect of pipes being placed too shallow and too close to trees was illustrated by short sections of pipes which become choked by tree roots and thereby rendered ineffective. Samples of good and bad types of subsoil pipes were also shown. (d) A collection of manufactured chemical and natural products, including rubber and other oils serviceable for killing mosquitoes and mosquito larvae, as well as types of oil-sprayers were exhibited. (e) The various methods of personal prophylaxis, including an exhibit of different forms of quinine, were displayed. All the exhibits were labelled with printed explanatory cards. Pamphlets on malaria in English and Jawi and English and Chinese were also distributed.

The Exhibition was opened for four days, and as it happened to be held during the August holidays, a large number of visitors than usual from various parts of the country came to see the Exhibition. The official attendance for the four days of the Exhibition is approximately 59,600 and at times the Medical and Health Sections were so crowded that people had difficulty in getting into the building.

Popular lectures on malaria were given in Malay and Chinese in various parts of the country; these were illustrated by lantern slides and were well attended.

A cinematograph film of work done at the Infant Welfare Centre, Kuala Lumpur, was also exhibited at the Horticultural Shows in Kuala Lumpur and Telok Datoh and on several other occasions to large and interested audiences of various nationalities.

Lectures on venereal diseases, illustrated by lantern slides, were given in Chinese, Tamil and other clubs and institutions.

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 QUARANTINE AND PORT HEALTH WORK.

38. A total of 80,399 immigrants passed through the Quarantine Camp, Port Swettenham, during the year 1927 as compared with 99,066 for the year 1926. Improvements were made in the Camp, whereby absconding was made more difficult.

During the year 64 ships with immigrant labourers were boarded and inspected. The labourers were landed at the Quarantine Camp. Of the 64 ships, 16 were infected—one with cholera, two with smallpox, two with cerebro-spinal meningitis, one with cerebro-spinal meningitis and chicken-pox and 10 with chicken-pox.



The number of immigrants who entered the Quarantine Station, Port Swettenham, was 80,399, the number remaining on 31st December, 1927, was 1,697, making a total of 82,096. The largest number of any one day was 7,649 on the 14th of July. The daily average of immigrants in the Camp was 2,241. The following table shows how these immigrants were distributed:

Discharged to Dépôt ... ..	80,298
Transferred to Klang Hospital ... ..	61
Absconded from the Quarantine Camp ... ..	58
Died in Hospital and Cholera Wards ... ..	260
Remaining on 31st December, 1927 ... ..	1,419
Total ... ..	82,096

There were 260 deaths giving a percentage of death to total arrivals of 0.31.

#### INFANT WELFARE WORK.

39. Infant Welfare work continues with great success and the attendances at the Clinics have greatly increased. The number attending Clinics in Kuala Lumpur, Ipoh, Taiping and Seremban for 1926 and 1927 were as follows:

Place.	1926.	1927.
Kuala Lumpur ... ..	29,831	33,979
Ipoh ... ..	14,080	16,796
Taiping ... ..	13,559	28,061
Seremban ... ..	3,895	13,640
Total ... ..	61,365	92,476

It is very gratifying to notice the increase in Malay attendances; in Kuala Lumpur they increased from 4,464 in 1926 to 10,833 in the year under review.

Each Centre is under the charge of a Lady Medical Officer and specially trained Infant Welfare Sisters and has also a staff of Asiatic Health Visitors who work part time visiting in the district.

These Centres do very excellent anti-natal work, and also serve as outdoor dispensaries for women and children. The numbers attending increase yearly and many patients seeking advice or treatment come from great distances. It is noteworthy that the infantile mortality figures of the four large towns are substantially reduced this year. In Seremban the infantile mortality rate was 147.30 as against 209.33 for the previous year.

The reports of the Lady Medical Officers are attached as Appendices (O), (P), (Q).

#### HOSPITALS, DISPENSARIES AND VENEREAL DISEASE CLINICS.

40. *Hospitals.*—The number of in-patients treated in hospitals was 142,094 with 11,743 and a death-rate of 8.26 as compared with 127,332 with 9,178 deaths and a death-rate of 7.21 in 1926. The distribution of patients in the different States was as shown below:

States.	1926.			1927.		
	Cases.	Deaths.	Death-rate.	Cases.	Deaths.	Death-rate.
Perak ... ..	56,909	3,970	6.98	61,050	4,811	7.88
Selangor ... ..	40,464	2,904	7.17	43,838	3,608	8.23
Negri Sembilan ... ..	19,400	1,615	8.32	23,116	2,250	9.73
Pahang ... ..	10,559	689	6.52	14,090	1,074	7.61
Total ... ..	127,332	9,178	7.21	142,094	11,743	8.26

During the year, efforts were made to introduce nursing by female Asiatic Nurses under the supervision of European Sisters into the acute male wards and this is now being done in the first and second class male Asiatic wards of some of the larger hospitals. The results are apparent on the improved appearance of the wards and the increased comforts of the patients. It is hoped to extend the system as more nurses and more accommodation for them becomes available. The lack of sufficient and suitable accommodation for Asiatic Nurses is an immense drawback to their recruitment.

41. The principal diseases commonly treated in hospitals were malaria, venereal diseases, ankylostomiasis, dysentery, diarrhoea, beri-beri, pneumonia and pulmonary tuberculosis. The following table shows the number of cases and deaths during the years 1926 and 1927 :

Diseases.	1926.			1927.		
	No. of cases.	No. of deaths.	Percentage of deaths.	No. of cases.	No. of deaths.	Percentage of deaths.
Malaria ...	38,633	1,792	4.64	49,452	2,543	5.14
Venereal diseases	4,428	51	1.15	5,236	74	1.41
Ankylostomiasis ...	2,493	120	4.81	2,284	94	4.12
Dysentery ...	3,848	852	22.14	4,797	1,294	26.98
Diarrhoea ...	2,566	344	13.41	2,577	379	14.71
Beri-beri ...	1,075	140	13.02	2,782	447	16.07
Pneumonia ...	2,666	1,202	45.09	3,021	1,440	47.67
Pulmonary tuberculosis ...	2,329	995	42.72	2,413	1,118	46.33

#### WOMEN'S HOSPITALS AND WARDS.

42. The work in the women's hospitals and wards continues to increase. It is very gratifying to note the increase in the number of Malays attending at the Kuala Kangsar Women's Hospital as out-patients where it exceeded by far that of other nationalities. The willingness of the Royal Malays to be admitted to the hospital has had a great influence on the other Malays. His Highness the Sultan of Perak's daughter was a patient in the hospital in October.

*Women's Wards, Ipoh Hospital.*—The number treated in these wards was 2,465 women as against 2,239 in the year 1926. In addition 909 children of 8 years and over were admitted as against 685 for the previous year.

The energy of the Lady Medical Officer, Ipoh, is responsible for the success of the Ipoh work.

#### SURGERY.

43. *Operations.*—The number of operations undertaken during the year is shewn below :

States.	Major.			Minor.		
	1926.		1927.	1926.		1927.
Perak ...	443	...	541	2,691	...	2,858
Selangor ...	311	...	503	1,257	...	1,817
Negri Sembilan ...	98	...	186	1,680	...	1,607
Pahang ...	17	...	36	314	...	400
Total ...	869	...	1,266	5,942	...	6,682

A Specialist Anaesthetist was appointed during the year and is stationed in Kuala Lumpur. The reports of the Chief Surgeons, Perak, Selangor and Negri Sembilan are attached as Appendices (F), (G) and (H).

#### EYE DISEASES.

44. *Out-Patients.*—The number of new cases during the year at the Eye Clinics was as follows :

	1926.	1927.
Kuala Lumpur ...	2,112	4,178
Ipoh and Taiping ...	3,740	5,646

There were a total number of 53,596 attendances as compared with 13,329 for the year 1926.

45. *In-Patients.*—One thousand five hundred and sixty-five cases were admitted into hospital as compared with 1,341 cases during the year 1926. The chief diseases met with were conjunctivitis, trachoma, gonorrhoeal-ophthalmia, ulcers and opacities of cornea, cataracts, neuroretinitis, glaucoma and injuries to cornea and eye-ball, resulting chiefly from accidents chiefly amongst the workmen in factories and metal quarries, and burns from acids and corrosives.

There are three treatment centres, Taiping, Ipoh and Kuala Lumpur, and the work is increasingly popular. The reports of the Ophthalmic Physician, Ipoh, and the Deputy Medical Officer in charge of Eye Clinic, Kuala Lumpur, are attached as appendices.



## CURE FOR OPIUM HABIT.

46. Only twenty-three cases, all in Pahang, were admitted for the cure of the opium habit during the year under review.

There is no demand for treatment when the country is prosperous, and little or no success from the methods, which were at first and too soon loudly acclaimed on insufficient evidence.

## X-RAY AND ELECTRICAL TREATMENT.

47. Dr. C. F. Constant was the Radiologist throughout the year. The figures given below show the actual number of patients treated or examined:

X-ray cases	...	...	...	...	...	...	...	2,300
Electrical treatment	...	...	...	...	...	...	...	850

There were new well organised X-Ray Departments in Kuala Lumpur, Ipoh and Seremban. A second Radiologist was appointed during the year; he is stationed in Ipoh. The Report of the Radiologist, Federated Malay States, is attached as Appendix (M).

Electrical treatment and the various treatments by rays and artificial sunlight are available, and the equipment of this branch of the department is very complete.

## HOSPITALS AND DISPENSARIES.

48. *Out-Patients.*—The number of out-patients treated in all hospitals, dispensaries, travelling dispensaries and dispensary boats for 1927 was 789,764 as compared with 630,052 in 1926. The following figures show the number treated during the past four years:

States.	1924.	1925.	1926.	1927.
Perak	221,096	216,282	210,511	292,087
Selangor	177,896	219,739	227,864	286,843
Negri Sembilan	96,432	99,047	101,652	108,314
Pahang	88,837	86,725	90,025	102,520
Total	584,261	621,793	630,052	789,764

Of the total of 789,764 cases, 170,267 were treated by the travelling dispensaries and 40,665 by dispensary boats on the Perak and Pahang rivers.

During the year under review a larger and improved type of travelling dispensaries were supplied. They are built on a one-ton Morris Chassis. They have replaced most of the Fords which were in use for many years and did excellent service.

Motor dispensary boats supplied by Messrs. Thornycrofts were supplied for the Pahang and Perak rivers. They have done very useful service in reaching the riverine population and distributing medicines in the kampongs on the river banks and have fully justified their purchase. The Perak river boat proved itself invaluable in the cholera outbreak in Lower Perak.

## PRISONS.

49. During 1927 the general health of the prisoners has continued to be satisfactory. The total number treated during the year in the different gaol hospitals was 853 with 32 deaths and a death-rate of 3.75 as against 635 with 10 deaths and a death-rate of 1.57 in the year 1926. They were distributed as in the following table:

Place.	1926.			1927.		
	Cases.	Deaths.	Per-centage.	Cases.	Deaths.	Per-centage.
Pudu Gaol, Kuala Lumpur	125	1	.80	109	2	1.78
Gaol, Taiping	141	7	4.96	178	12	6.74
„ Batu Gajah	178	—	—	319	9	2.82
„ Seremban	119	2	1.68	156	6	3.87
„ Kuala Lipis	55	—	—	47	2	4.44
„ Kuantan	17	—	—	44	1	2.27
Total	635	10	1.57	853	32	3.75

As is usual, all new prisoners are kept under observation. Their bloods and faeces are examined and they are vaccinated before being passed to labour.

There were small outbreaks of beri-beri which were traced to overmilling of the rice supplied.

## LEPER ASYLUMS.

50. *Kuala Lumpur*.—The total number of lepers treated during the year was 818. There were 64 deaths giving a death-rate of 7.81 per cent. as compared with 704 treated and a death-rate of 4.88 per cent. in 1926. The report of the Medical Officer in charge of the Leper Asylum is attached (Appendix N).

51. *Pulau Pangkor Laut*.—In this Asylum which is for Malays only 72 cases of leprosy were treated during the year. There were 15 deaths. The Medical Officer, Lower Perak, in reporting on the treatment writes: "Tai Foong Chee with Foh Mah Yean treatment for leprosy was continued throughout the year. I regret to record that the results are not very satisfactory perhaps due to the lack of sympathy on the part of the patients. However, two cases were discharged on parole during the year. Injections of E.C.C.O. were given twice weekly during the year. The two patients who were discharged on parole were treated both with injections of Tai Foong Chee with Foh Mah Yean".

52. *Taiping Leper Wards*.—One hundred and seventy-six cases treated with 24 deaths. It is to be hoped that all lepers will shortly be transferred to Kuala Lumpur Leper Asylum leaving these wards to be used merely as receiving centres for Perak.

## TEMPORARY CHINESE DECREPIT ASYLUM, PORT SWETTENHAM.

53. There were 229 decrepits remaining on 31st December, 1926, and the number remaining at the end of 1927 was 186. No new decrepits were admitted during the year under review. It is hoped to house all the vagrants and decrepits at the Sungei Buloh Decrepit Home early in 1928.

## VETERINARY BRANCH.

54.

## RINDERPEST.

	States.				Cases.		Deaths.		Destroyed.
Perak	...	...	...	...	—	...	—	...	—
Selangor	...	...	...	...	33	...	20	...	—
Negri Sembilan	...	...	...	...	3	...	1	...	—
Pahang	...	...	...	...	44	...	36	...	7
Total					80	...	57	...	7

No case of rinderpest occurred in the State of Perak during the year under review.

There were two outbreaks of this disease amongst buffaloes in Ulu Selangor district, in the State of Selangor, involving 33 animals, of which 20 died. The origin of the outbreak is obscure. Two bovines from Singapore developed rinderpest in the Quarantine Station, Kuala Lumpur. One died and the other was slaughtered. There was a simultaneous outbreak of rinderpest in Singapore amongst animals from Siam. The disease did not spread either within or without the Quarantine Station, Kuala Lumpur. There was no rinderpest amongst animals imported at the Quarantine Station at Port Swettenham.

*Negri Sembilan*.—Three cases of this disease occurred near Kuala Pilah early in January; the last case died on January 14th. These were the last cases of the large outbreak of this disease that occurred during 1926 and were included in that year's report where this outbreak was dealt with. The quarantine restrictions on the movement of cattle, etc., were maintained for some time but were eventually removed about the end of March.

*Pahang*.—A severe outbreak of this disease occurred in the Kuantan district beginning in the later month of 1926 and only terminating in September, 1927, the areas affected being Kuala Kuantan and Coast north to Trengganu and south to Penor. There was also an outbreak of the disease in the Pekan district commencing from April and terminating in November.



55

## FOOT-AND-MOUTH DISEASES.

	States.	Cases.	Deaths.	Destroyed.
Perak	... ..	1,346	9	—
Selangor	... ..	1,268	6	—
Negri Sembilan	... ..	814	—	—
Pahang	... ..	189	1	2
Total		3,617	16	2

## RABIES.

56. Forty-two cases of rabies occurred, 22 in Perak and 20 in Negri Sembilan. Of the former, five died and 17 were destroyed. No cases occurred in other States during the year.

*Perak.*—One outbreak occurred in Upper Perak, the first case being on the 30th of April: 22 animals were infected, of which five died and 17 were destroyed. Three persons are known to have been bitten, of whom two were treated and one had returned to Siam by the time of detection of the disease. In the case of one other person bitten the dog on slaughter ten days later showed no Negri bodies. This outbreak originated, apparently, from Siam. The last case occurred on 25th June.

*Negri Sembilan.*—This disease was prevalent throughout the year. In all there were 20 cases, mostly in the Seremban district. Muzzling orders were in force covering the whole of Seremban and Coast districts, the Rembau sub-district and parts of Kuala Pilah district. Two of the cases were cows and the remainder dogs. Forty-two dogs were kept under observation as suspicious for rabies or for having bitten people. Of these, 11 proved rabied. Thirty-four suspected brains were sent to the Institute for Medical Research for examination, 19 proved positive for rabies. Thirty persons from Negri Sembilan took the complete course of Pasteur treatment in the Institute for Medical Research.

Two hundred and forty dogs and one cat were vaccinated with the special canine anti-rabic vaccine supplied by the Institute for Medical Research.

## SWINE FEVER.

57. There were two outbreaks of this disease in Negri Sembilan during the year, the first at Bahau in February and March where 23 pigs were affected, of which 12 died and 11 were destroyed, and the second at Batang Malaka in October where 23 pigs were affected and of which six died and 17 were destroyed. Compensation amounting to \$52 was paid at Batang Malaka. No cases occurred in the other States.

## SURRA.

58. There were only three cases of this disease. They occurred in dogs. One was in the case of a dog brought to the Animal Infirmary, Taiping, for treatment, and was found to be infected and destroyed. The other two were found in dogs in Raub district in Pahang. One was destroyed and the other is still under treatment.

## VETERINARY QUARANTINE STATION.

59. *Port Swettenham.*—Sixteen thousand and twenty-three animals were imported, including 4,232 cattle which were quarantined for ten days. Seven of the latter animals died from disease as follows: 1 pneumonia, 1 injuries, 5 septicaemia, 1 gastro-intestinal impaction, 1 enteritis and 1 haemorrhage septicaemia. There were sixty animals affected with foot-and-mouth disease from March to May, inclusive, all of which recovered. A temporary landing pier was constructed towards the end of the year and its utility would justify the construction of a permanent stone structure.

60. *Kuala Lumpur.*—One thousand four hundred and forty-six cattle were quarantined, these being chiefly animals from Singapore. From March to July there were 68 cases of foot-and-mouth disease with one death. In August there were two cases of rinderpest in animals from Singapore. One died and the other was destroyed. The disease did not spread.

61. *Pahang*.—Two new veterinary quarantine stations were opened, one in Merapoh and the other at Jerantut during the year under review. The total number of cattle that passed through these stations was 164.

62. *Perak*.—The following cattle were quarantined at:

Port Weld	...	...	...	...	...	...	...	1,327
Upper Perak	...	...	...	...	...	...	...	1,375
Parit Buntar	...	...	...	...	...	...	...	231
Selama	...	...	...	...	...	...	...	83
Teluk Anson	...	...	...	...	...	...	...	294

63. *Negri Sembilan*.—The following animals were passed through the cattle quarantine stations during the year:

Seremban	...	...	...	...	...	98 buffaloes	47 cattle
Tampin	...	...	...	...	...	36	„ 47 „
Port Dickson	...	...	...	...	...	—	35 „
Sungei Dua	...	...	...	...	...	22	„ —

A new Cattle Quarantine Station was opened at Gemas in December.

#### VETERINARY PROSECUTIONS.

64. There were a total number of 1,054 prosecutions resulting in 990 convictions. The fines imposed amounted to a total of \$10,858.50. They were distributed as follows:

	States.		Prosecutions.		Convictions.		Fines.
Perak	...	...	478	...	450	...	\$ 5,461.00
Selangor	...	...	339	...	327	...	2,860.00
Negri Sembilan	...	...	195	...	177	...	2,253.75
Pahang	...	...	42	...	36	...	283.75
Total			1,054	...	990	...	\$10,858.50

#### SCIENTIFIC.

##### COMMENTS ON THE ANNUAL REPORT OF THE DIRECTOR, INSTITUTE FOR MEDICAL RESEARCH, FEDERATED MALAY STATES.

65. The annual report of the Director, Institute for Medical Research, is attached. It is a voluminous document recording a great volume of valuable work accomplished, and it is also a record of the work of indefatigable officers who have spared nothing to attain successful results.

A list of appendices and reports is attached.

##### COMMENTS ON THE REPORT OF THE MEDICAL SUPERINTENDENT, CENTRAL MENTAL HOSPITAL, TANJONG RAMBUTAN.

66. There were at the end of 1927, one thousand three hundred and sixteen male and three hundred and eighty-six female patients at the Central Mental Hospital. They were made up as follows:

					Males.		Females.
Remained on 31st December, 1926	...	...	...	...	1,212	...	338
Admitted during 1927	...	...	...	...	585	...	188
Discharged—Recovered	...	...	...	...	228	...	64
„ Relieved	...	...	...	...	50	...	17
„ Not improved	...	...	...	...	39	...	15
„ Not insane	...	...	...	...	1	...	0
Absconded	...	...	...	...	63	...	1
Died	...	...	...	...	100	...	43
Total patients remaining on 31st December, 1927	...	...	...	...	1,316	...	386



67. The following admissions were made during the year from places outside the Federated Malay States:

Places.							Males.		Females.
Singapore	...	...	...	...	...	...	46	...	1
Kedah	...	...	...	...	...	...	58	...	14
Perlis	...	...	...	...	...	...	3	...	—
Kelantan	...	...	...	...	...	...	4	...	1

68. *Admissions*.—The total admissions during the year were 900 which show an increase of 165 on last year, when the number was 735. In 1925 the total admissions were 666.

69. *Discharges*.—These numbered 414 as against 360 last year and 276 in 1925. Of these, 292 were discharged recovered and 67 as relieved. Those discharged “relieved” number 67 while the balance of 55 was made up of one, not insane and 54 who were discharged “unimproved” under bond, who, in the majority of cases, were removed to their own country by their friends.

70. The following are attached as appendices:

- A.—Report of the Director, Institute for Medical Research.
- B.—Report of the Malaria Research Officer, Institute for Medical Research.
- C.—Report of the Chemist, Institute for Medical Research.
- D.—Report of the Chief Health Officer, Federated Malay States.
- E.—Report of the Registrar-General of Births and Deaths.
- F.—Report of the Chief Surgeon, Perak.
- G.—Report of the Chief Surgeon, Selangor.
- H.—Report of the Chief Surgeon, Negri Sembilan.
- I.—Report of the Medical Superintendent, Central Mental Hospital.
- J.—Report of the Specialist, Venereal Diseases.
- K.—Report of the Ophthalmologist Surgeon, Ipoh.
- L.—Report of the Deputy Medical Officer in Charge of Ophthalmic Clinic, Kuala Lumpur.
- M.—Report of the Radiologist, Federated Malay States.
- N.—Report of the Medical Officer in Charge of Leper Asylum, Kuala Lumpur.
- O.—Report of the Lady Medical Officer, Infant Welfare Centre, Kuala Lumpur.
- P.—Report of the Lady Medical Officer, Infant Welfare Centre, Ipoh.
- Q.—Report of the Lady Medical Officer, Infant Welfare Centre, Taiping.

KUALA LUMPUR,  
29th May, 1928.

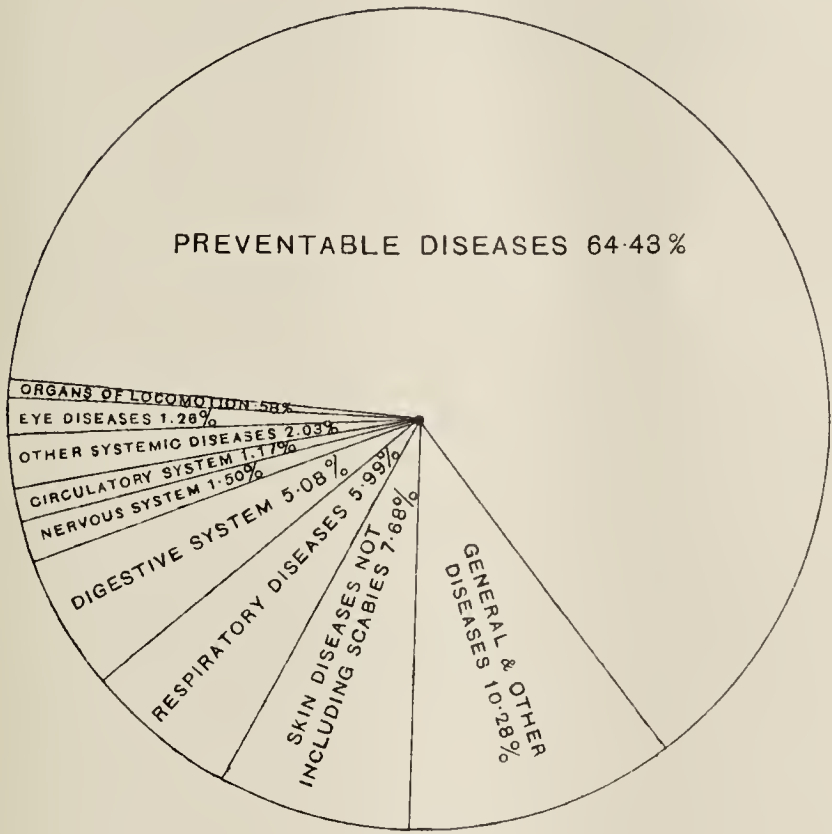
R. DOWDEN,  
Principal Medical Officer, F.M.S.



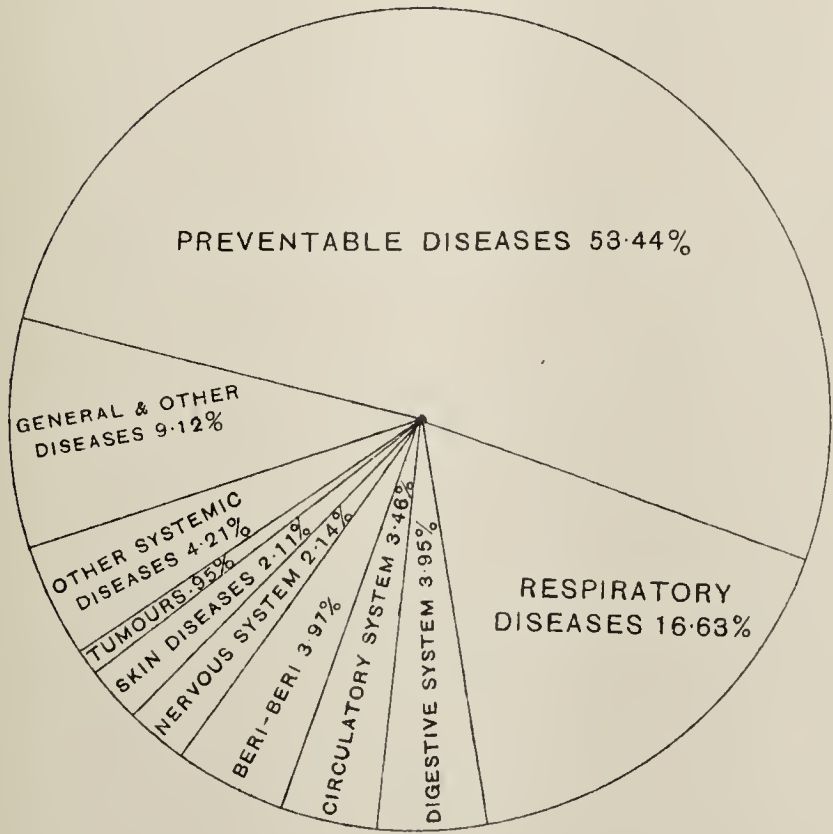


GENERAL SYSTEMIC & PREVENTABLE DISEASES

TOTAL CASES - 136437



TOTAL DEATHS - 11266

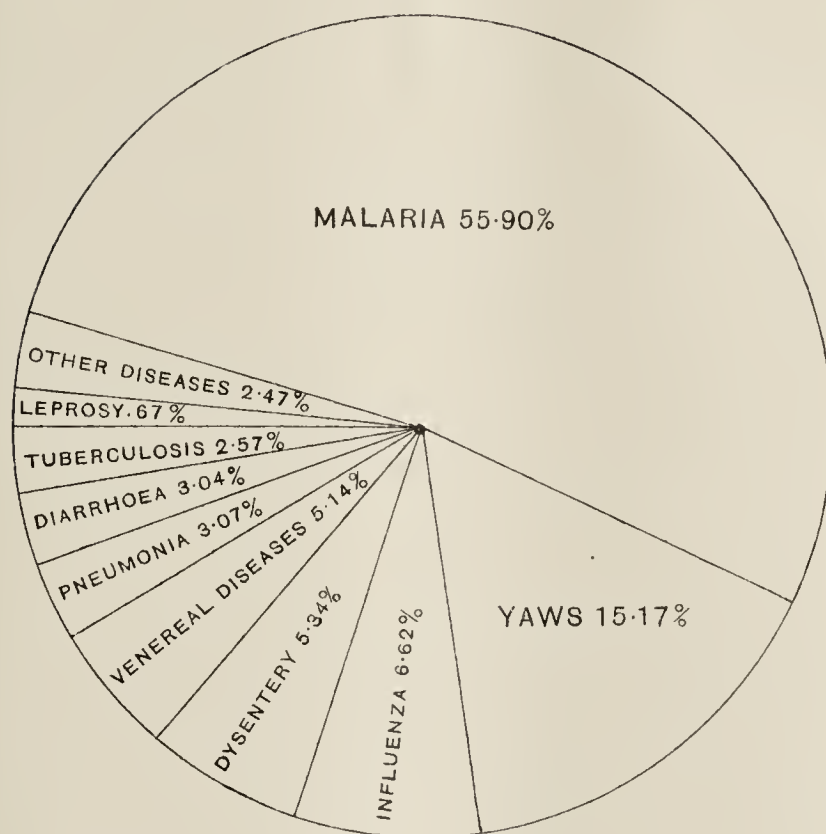






# INFECTIVE DISEASES

## TOTAL CASES - 86968



## TOTAL DEATHS - 7122

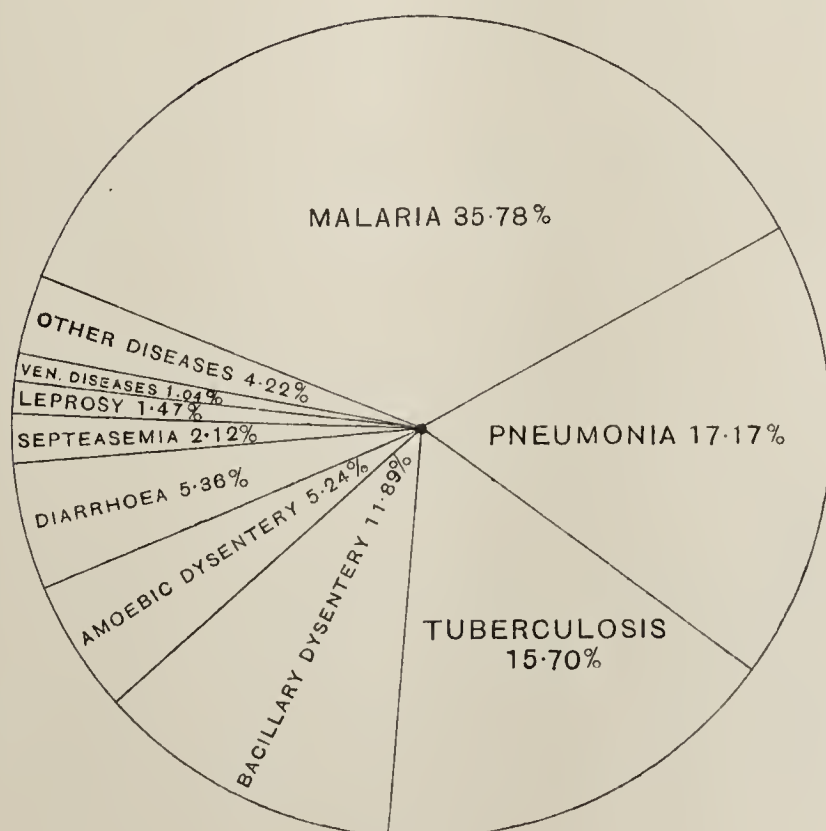






TABLE 1.

## RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927.

The form shows in the main the arrangement of diseases in the International Nomenclature, 1921 Edition. To save space the unimportant diseases of any class can be grouped in their places as "Other Diseases" of the class.

\* i.e. the year previous to that for which the return is made.

† "Total cases treated" will, of course, include those remaining in hospital at the end of the previous year.

‡ The figures in this column to be carried on to the next year's return.

Diseases.	* Remaining in hospital at end of 1926.	Yearly total.		† Total cases treated.	‡ Remaining in hospital at end of 1927.	Remarks.
		Admis- sions.	Deaths.			
I.—EPIDEMIC, ENDEMIC, AND INFECTIOUS DISEASES.						
1. Enteric group ... ..	1	6	1	7	...	
(a) Typhoid fever ... ..	12	108	37	120	9	
(b) Paratyphoid A. ... ..	...	3	...	3	1	
(c) Paratyphoid B. ... ..	2	11	4	13	...	
(d) Type not defined ... ..	...	26	2	26	1	
2. Typhus ... ..	3	39	5	42	2	
3. Relapsing fever ... ..	...	...	...	...	...	
4. Undulant fever ... ..	14	305	5	319	9	
5. Malaria ... ..	9	425	46	434	12	
(a) Tertian ... ..	277	12,013	255	12,290	341	
(b) Quartan ... ..	7	581	18	588	16	
(c) Aestivo—autumnal ... ..	388	23,085	1,657	23,473	530	
(d) Cachexia ... ..	197	12,462	564	12,659	350	
(e) Black-water ... ..	...	56	8	56	...	
6. Small-pox ... ..	...	51	3	51	...	
Alastrim ... ..	...	...	...	...	...	
7. Measles ... ..	7	356	7	363	5	
8. Scarlet fever ... ..	...	...	...	...	...	
9. Whooping cough ... ..	1	54	6	55	4	
10. Diphtheria ... ..	3	42	17	45	...	
11. Influenza ... ..	89	5,753	43	5,842	89	
12. Miliary fever ... ..	...	...	...	...	...	
13. Mumps ... ..	1	259	1	260	3	
14. Cholera ... ..	...	24	17	24	...	
15. Epidemic diarrhœa ... ..	...	...	...	...	...	
16. Dysentery—						
(a) Amœbic ... ..	55	1,750	373	1,805	84	
(b) Bacillary ... ..	84	2,309	847	2,393	102	
(c) Undefined or due to other causes ... ..	23	589	75	612	27	
17. Plague—						
(a) Bubonic ... ..	...	21	20	21	...	
(b) Pneumonic ... ..	...	...	...	...	...	
(c) Septicæmic ... ..	...	4	3	4	...	
(d) Undefined ... ..	...	...	...	...	...	
18. Yellow fever ... ..	...	...	...	...	...	
19. Spirochætosis ... ..	...	3	...	3	...	
Ictero-hæmorrhagica ... ..	...	16	1	16	1	
20. Leprosy ... ..	719	583	105	1,302	799	
21. Erysipelas ... ..	...	83	16	83	5	
22. Acute poliomyelitis ... ..	...	...	...	...	...	
23. Encephalitis lethargica ... ..	1	6	3	7	1	
24. Epidemic cerebro-spinal fever ... ..	3	15	9	18	1	

TABLE 1—(cont.)

## RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—(cont.)

Diseases.	* Remaining in hospital at end of 1926.	Yearly total.		† Total cases treated.	‡ Remaining in hospital at end of 1927.	Remarks.
		Admis- sions.	Deaths.			
I.—EPIDEMIC, ENDEMIC, AND INFECTIOUS DISEASES—(cont.)						
25. Other epidemic diseases... ..	...	2	...	2	...	
(a) Rubeola (German measles) ... ..	...	3	...	3	...	
(b) Varicella (chicken-pox) ... ..	1	111	...	112	7	
(c) Kala-azar ... ..	...	...	...	...	...	
(d) Phlebotomus fever ... ..	...	...	...	...	...	
(e) Dengue ... ..	...	52	...	52	...	
(f) Epidemic dropsy ... ..	...	2	...	2	...	
(g) Yaws ... ..	9	174	...	183	12	
(h) Trypanosomiasis ... ..	...	...	...	...	...	
26. Glanders ... ..	...	...	...	...	...	
27. Anthrax ... ..	...	...	...	...	...	
28. Rabies ... ..	...	...	...	...	...	
29. Tetanus ... ..	1	61	43	62	1	
30. Mycosis ... ..	...	1	1	1	...	
31. Tuberculosis, pulmonary and laryngeal ... ..	177	2,236	1,118	2,413	163	
32. Tuberculosis of the meninges or central nervous system ... ..	...	6	5	6	...	
33. Tuberculosis of the intestines or peritoneum ... ..	...	26	16	26	1	
34. Tuberculosis of the vertebral column ... ..	2	6	3	8	...	
35. Tuberculosis of bones and joints ... ..	4	35	12	39	7	
36. Tuberculosis of other organs ... ..	...	4	3	4	...	
(a) Skin or subcutaneous tissue (lupus) ... ..	1	9	2	10	...	
(b) Bones ... ..	...	4	1	4	1	
(c) Lymphatic system ... ..	1	42	7	43	4	
(d) Genito-urinary ... ..	...	8	3	8	...	
(e) Other organs ... ..	...	6	2	6	1	
37. Tuberculosis disseminated ... ..	...	1	...	1	...	
(a) Acute ... ..	...	19	17	19	...	
(b) Chronic ... ..	1	3	3	4	...	
38. Syphilis—						
(a) Primary ... ..	51	765	...	816	39	
(b) Secondary ... ..	48	987	15	1,035	77	
(c) Tertiary ... ..	36	388	30	424	29	
(d) Hereditary ... ..	1	51	20	52	3	
(e) Period not indicated ... ..	1	17	4	18	1	
39. Soft chancre ... ..	12	525	...	537	25	
40. A.—Gonorrhœa and its complications ... ..	54	1,427	2	1,481	71	
B.—Gonorrhœal ophthalmia ... ..	4	93	1	97	4	
C.—Gonorrhœal arthritis ... ..	11	207	1	218	21	
D.—Granuloma venereum ... ..	2	13	1	15	1	
41. Septicæmia ... ..	...	167	151	167	1	
42. Other infectious diseases ... ..	5	203	17	208	2	
Trypanosomiasis ... ..	...	...	...	...	...	
II.—GENERAL DISEASES NOT MENTIONED ABOVE.						
43. Cancer or other malignant tumours of the buccal cavity ... ..	3	37	22	40	...	
44. Cancer or other malignant tumours of the stomach or liver ... ..	...	56	37	56	1	
45. Cancer or other malignant tumours of the peritoneum intestines, rectum ... ..	...	10	3	10	2	
46. Cancer or other malignant tumours of the female genital organs ... ..	...	22	5	22	2	



TABLE 1—(cont.)

RETURN OF DISEASES AND DEATHS. (IN-PATIENTS) FOR THE YEAR 1927—(cont.)

Diseases.	* Remaining in hospital at end of 1926.	Yearly total.		† Total cases treated.	‡ Remaining in hospital at end of 1927.	Remarks.
		Admis- sions.	Deaths.			
II.—GENERAL DISEASES NOT MENTIONED ABOVE—(cont.)						
47. Cancer or other malignant tumours of the breast ... ..	1	7	3	8	...	
48. Cancer or other malignant tumours of the skin ... ..	2	27	14	29	1	
49. Cancer or other malignant tumours of organs not specified ... ..	4	33	15	37	1	
50. Tumours non-malignant ... ..	4	157	8	161	5	
51. Acute rheumatism ... ..	2	259	3	261	5	
52. Chronic rheumatism ... ..	13	140	2	153	6	
53. Scurvy (including Barlow's disease) ... ..	2	24	9	26	1	
54. Pellagra ... ..	...	1	...	1	...	
55. Beri-beri ... ..	157	2,625	447	2,782	306	
56. Rickets ... ..	...	9	3	9	1	
57. Diabetes (not including insipidus) ... ..	5	72	9	77	6	
58. Anæmia ... ..	...	86	23	86	13	
(a) Pernicious ... ..	6	98	30	104	3	
(b) Other anæmias and chlorosis ... ..	34	1,280	352	1,314	48	
59. Diseases of the pituitary body ... ..	...	...	...	...	...	
60. Diseases of the thyroid gland—						
(a) Exophthalmic goitre ... ..	...	2	...	2	...	
(b) Other diseases of the thyroid gland, myxœdema ... ..	...	4	...	4	...	
61. Diseases of the para-thyroid glands ... ..	...	3	...	3	...	
62. Diseases of the thymus ... ..	...	...	...	...	...	
63. Diseases of the supra-renal glands ... ..	...	5	1	5	...	
64. Diseases of the spleen ... ..	2	164	3	166	8	
65. Leukæmia—						
(a) Leukæmia ... ..	...	3	3	3	...	
(b) Hodgkin's disease ... ..	...	2	...	2	...	
66. Alcoholism ... ..	1	36	3	37	...	
67. Chronic poisoning by mineral substances (lead, mercury, etc.) ... ..	4	79	4	83	4	
68. Chronic poisoning by organic substances (morphia, cocaine, etc.) ... ..	4	295	62	299	39	
69. Other general diseases ... ..	...	1	...	1	...	
Auto-intoxication ... ..	...	...	...	...	...	
Purpura hæmorrhagica ... ..	...	...	...	...	...	
Hæmophilia ... ..	...	...	...	...	...	
Diabetes insipidus ... ..	...	13	1	13	...	
III.—AFFECTIONS OF THE NERVOUS SYSTEM AND ORGANS OF THE SENSES.						
70. Encephalitis (not including encephalitis Lethargica) ... ..	...	18	12	18	1	
71. Meningitis (not including tuberculous meningitis or cerebro-spinal meningitis)...	1	70	55	71	4	
72. Locomotor ataxia ... ..	3	22	2	25	4	
73. Other affections of the spinal cord ... ..	...	48	6	48	2	
74. Apoplexy ... ..	...	4	3	4	...	
(a) Hæmorrhage ... ..	4	43	27	47	...	
(b) Embolism ... ..	...	2	1	2	...	
(c) Thrombosis ... ..	...	3	2	3	...	

TABLE 1—(cont.)

## RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—(cont.)

Diseases.	* Remaining in hospital at end of 1926.	Yearly total.		† Total cases treated.	‡ Remaining in hospital at end of 1927.	Remarks.
		Admis- sions.	Deaths.			
III.—AFFECTIONS OF THE NERVOUS SYSTEM AND ORGANS OF THE SENSES—(cont.)						
75. Paralysis ... ..	...	3	2	3	1	
(a) Hemiplegia ... ..	35	143	25	178	31	
(b) Other paralyses ... ..	33	112	24	145	22	
76. General paralysis of the insane ... ..	...	14	2	14	2	
77. Other forms of mental alienation ... ..	16	464	2	480	7	
78. Epilepsy ... ..	5	111	10	116	1	
79. Eclampsia, convulsions (non-puerperal) 5 years or over ... ..	1	29	5	30	1	
80. Infantile convulsions ... ..	1	71	43	72	...	
81. Chorea ... ..	...	3	...	3	...	
82. A.—Hysteria ... ..	...	14	...	14	...	
B.—Neuritis ... ..	10	220	2	230	16	
C.—Neurasthenia ... ..	1	37	...	38	3	
83. Cerebral softening ... ..	1	18	8	19	...	
84. Other affections of the nervous system, such as paralysis agitans ... ..	8	255	7	263	6	
85. Affections of the organs of vision ... ..	...	1	...	1	...	
(a) Diseases of the eye ... ..	61	167	2	228	68	
(b) Conjunctivitis ... ..	16	658	...	674	22	
(c) Trachoma ... ..	15	117	...	132	25	
(d) Tumours of the eye ... ..	...	4	...	4	...	
(e) Other affections of the eye ... ..	123	783	4	906	128	
86. Affections of the ear or mastoid sinus ... ..	6	338	3	344	12	
IV.—AFFECTIONS OF THE CIRCULATORY SYSTEM.						
87. Pericarditis ... ..	...	27	19	27	...	
88. Acute endocarditis or myocarditis ... ..	1	34	20	35	1	
89. Angina pectoris ... ..	...	9	1	9	...	
90. Other diseases of the heart ... ..	3	83	56	86	1	
(a) Valvular ... ..	4	133	57	137	8	
Mitral ... ..	14	198	82	212	11	
Aortic ... ..	...	65	37	65	4	
Tricuspid ... ..	...	1	...	1	...	
Pulmonary ... ..	...	2	1	2	...	
(b) Myocarditis ... ..	...	77	46	77	1	
91. Diseases of the arteries ... ..	...	3	3	3	...	
(a) Aneurism ... ..	...	43	15	43	1	
(b) Arterio-sclerosis ... ..	2	21	3	23	3	
(c) Other diseases ... ..	...	13	6	13	1	
92. Embolism or thrombosis (non-cerebral) ... ..	...	8	4	8	...	
93. Diseases of the veins—						
Hæmorrhoids ... ..	8	239	3	247	4	
Varicose veins ... ..	...	17	...	17	...	
Phlebitis ... ..	1	20	1	21	1	
94. Diseases of the lymphatic system ... ..	1	19	1	20	1	
Lymphangitis ... ..	3	68	...	71	2	
Lymphadenitis, bubo (non-specific) ... ..	40	509	1	549	28	
95. Hæmorrhage of undetermined cause ... ..	...	7	5	7	...	
96. Other affections of the circulatory system ... ..	...	20	9	20	1	



TABLE 1—(cont.)

## RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—(cont.)

Diseases,	* Remaining in hospital at end of 1926.	Yearly total.		† Total cases treated.	‡ Remaining in hospital at end of 1927.	Remarks.
		Admis- sions.	Deaths.			
V.—AFFECTIONS OF THE RESPIRATORY SYSTEM.						
97. Diseases of the nasal passages ... ..	...	77	...	77	2	
Adenoids ... ..	...	20	...	20	2	
Polypus ... ..	...	16	...	16	...	
Rhinitis ... ..	...	15	...	15	1	
Coryza ... ..	...	218	...	218	6	
98. Affections of the larynx—						
Laryngitis ... ..	...	24	2	24	1	
99. Bronchitis ... ..	5	182	2	187	6	
(a) Acute ... ..	61	2,277	43	2,338	72	
(b) Chronic ... ..	35	957	94	992	52	
100. Broncho-pneumonia ... ..	17	642	290	659	28	
101. Pneumonia ... ..	1	52	22	53	...	
(a) Lobar ... ..	41	2,203	1,126	2,244	80	
(b) Unclassified ... ..	13	423	175	436	18	
102. Pleurisy, empyema ... ..	14	312	54	326	19	
103. Congestion of the lungs ... ..	...	5	2	5	...	
104. Gangrene of the lungs ... ..	1	28	26	29	...	
105. Asthma ... ..	26	671	23	697	22	
106. Pulmonary emphysema ... ..	...	4	...	4	1	
107. Other affections of the lungs ... ..	8	52	15	60	3	
Pulmonary spirochaetosis ... ..	...	...	...	...	...	
VI.—DISEASES OF THE DIGESTIVE SYSTEM.						
108. A.—Diseases of teeth or gums ... ..	...	25	1	25	2	
Caries, pyorrhœa, etc. ... ..	2	189	2	191	3	
B.—Other affections of the mouth ... ..	...	21	7	21	...	
Stomatitis ... ..	...	93	3	93	1	
Glossitis, etc. ... ..	2	23	3	25	1	
109. Affections of the pharynx or tonsils ... ..	...	2	...	2	...	
Tonsillitis ... ..	7	192	2	199	3	
Pharyngitis ... ..	1	162	...	163	4	
110. Affections of the œsophagus ... ..	...	9	...	9	2	
111. A.—Ulcer of the stomach ... ..	2	56	12	58	...	
B.—Ulcer of the duodenum ... ..	1	40	4	41	1	
112. Other affections of the stomach ... ..	...	32	2	32	1	
Gastritis ... ..	9	360	11	369	5	
Dyspepsia, etc. ... ..	10	552	3	562	20	
113. Diarrhœa and enteritis ... ..	...	57	9	57	2	
Under two years ... ..	8	511	75	519	11	
114. Diarrhœa and Enteritis ... ..	1	54	...	55	1	
Two years and over ... ..	64	1,855	291	1,919	48	
Colitis ... ..	6	156	6	162	8	
Ulceration ... ..	...	10	1	10	...	
114A. Sprue ... ..	3	76	12	79	1	
115. Ankylostomiasis ... ..	55	2,191	94	2,246	63	
116. Diseases due to intestinal parasites—						
(a) Cestoda (tænia) ... ..	1	2	...	3	...	
(b) Trematoda (flukes) ... ..	...	...	...	...	...	
(c) Nematoda (other than ankylostoma) ... ..	...	...	...	...	...	
Ascaris ... ..	36	2,493	17	2,529	64	
Trichocephalus dispar ... ..	...	4	...	4	...	
Trichina ... ..	...	1	...	1	...	
Dracunculus ... ..	1	39	...	40	...	
Strongylus ... ..	...	...	...	...	...	
Oxyuris ... ..	...	1	...	1	...	

TABLE 1—(cont.)

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—(cont.)

Diseases.	* Remaining in hospital at end of 1926.	Yearly total.		† Total cases treated.	‡ Remaining in hospital at end of 1927.	Remarks.
		Admis- sions.	Deaths.			
VI.—DISEASES OF THE DIGESTIVE SYSTEM—(cont.)						
Diseases due to intestinal parasites—(cont.)						
(d) Coccidia ... ..	...	...	...	...	...	
(e) Other parasites ... ..	...	13	2	13	...	
(f) Unclassified ... ..	...	9	...	9	...	
117. Appendicitis ... ..	6	165	7	171	10	
118. Hernia ... ..	24	222	10	246	15	
119. A.—Affections of the anus, fistula, etc. ...	4	171	3	175	8	
B.—Other affections of the intestines ...	...	104	16	104	2	
Enteroptosis ... ..	...	2	...	2	2	
Constipation ... ..	6	697	...	703	12	
120. Acute yellow atrophy of the liver ... ..	...	1	1	1	...	
121. Hydatid of the liver ... ..	...	...	...	...	...	
122. Cirrhosis of the liver ... ..	11	81	41	92	4	
(a) Alcoholic ... ..	...	5	1	5	...	
(b) Other forms ... ..	15	282	131	297	33	
123. Biliary Calculus ... ..	...	4	...	4	...	
124. Other affections of the liver ... ..	...	9	3	9	...	
Abscess ... ..	7	121	23	128	5	
Hepatitis ... ..	7	190	3	197	7	
Cholecystitis ... ..	...	50	12	50	...	
Jaundice ... ..	2	129	25	131	1	
125. Diseases of the pancreas ... ..	...	3	3	3	...	
126. Peritonitis (of unknown cause) ... ..	1	81	66	82	...	
127. Other affections of the digestive system ...	15	212	19	227	9	
VII.—DISEASES OF THE GENITO-URINARY SYSTEM (NON-VENEREAL).						
128. Acute nephritis ... ..	20	567	175	587	26	
129. Chronic ... ..	26	522	216	548	26	
130. A.—Chyluria ... ..	...	...	...	...	...	
B.—Schistosomiasis ... ..	...	...	...	...	...	
131. Other affections of the kidneys ... ..	2	69	18	71	8	
Pyelitis, etc. ... ..	2	43	10	45	1	
132. Urinary calculus ... ..	2	60	2	62	5	
133. Diseases of the bladder ... ..	1	21	2	22	2	
Cystitis ... ..	2	81	13	83	2	
134. Diseases of the urethra ... ..	...	6	...	6	...	
(a) Stricture ... ..	3	97	...	100	2	
(b) Other ... ..	13	319	6	332	21	
135. Diseases of the prostate ... ..	1	1	...	2	...	
Hypertrophy ... ..	...	16	...	16	...	
Prostatitis ... ..	...	17	...	17	3	
136. Diseases (non-venereal) of the genital organs of man ... ..	7	152	2	159	8	
Epididymitis ... ..	1	77	...	78	...	
Orchitis ... ..	4	107	...	111	2	
Hydrocele ... ..	5	78	1	83	4	
Ulcer of Penis ... ..	1	62	...	63	2	
137. Cysts or other non-malignant tumours of the ovaries ... ..	1	12	1	13	1	
138. Salpingitis ... ..	...	32	1	32	3	
Abscess of the pelvis... ..	...	6	...	6	...	
139. Uterine tu nours (non-malignant) ... ..	...	11	...	11	1	
140. Uterine hæmorrhage (non-puerperal) ...	1	63	...	64	...	



TABLE 1—(cont.)

## RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—(cont.)

Diseases.	* Remaining in hospital at end of 1926.	Yearly total.		† Total cases treated.	‡ Remaining in hospital at end of 1927.	Remarks.
		Admis- sions.	Deaths.			
VII.—DISEASES OF THE GENITO-URINARY SYSTEM (NON-VENEREAL)—(cont.)						
141. A.—Metritis ... ..	...	28	2	28	...	
B.—Other affections of the female genital organs ... ..	5	126	3	131	5	
Displacements of uterus ... ..	...	37	...	37	2	
Amenorrhœa ... ..	...	12	...	12	...	
Dysmenorrhœa ... ..	1	24	...	25	...	
Leucorrhœa ... ..	3	77	...	80	2	
142. Diseases of the breast (non-puerperal) ... ..	...	4	...	4	...	
Mastitis ... ..	1	19	...	20	1	
Abscess of breast ... ..	...	22	...	22	3	
VIII.—PUERPERAL STATE.						
143. A.—Normal labour ... ..	78	2,382	8	2,460	93	
B.—Accidents of Pregnancy ... ..	...	26	1	26	2	
(a) Abortion ... ..	...	201	3	201	8	
(b) Ectopic gestation ... ..	...	11	1	11	1	
(c) Other accidents of pregnancy ... ..	2	217	24	219	4	
144. Puerperal hæmorrhage ... ..	...	5	1	5	...	
145. Other accidents of parturition ... ..	2	64	13	66	2	
146. Puerperal septicæmia ... ..	...	122	62	122	4	
147. Phlegmasia dolens ... ..	1	1	...	2	1	
148. Puerperal eclampsia ... ..	1	41	17	42	...	
149. Sequelæ of labour ... ..	...	19	1	19	1	
150. Puerperal affections of the breast ... ..	...	7	...	7	...	
Pregnancy ... ..	9	147	3	156	16	
IX.—AFFECTIONS OF THE SKIN AND CELLULAR TISSUES.						
151. Gangrene ... ..	4	70	28	74	9	
152. Boil ... ..	...	150	...	150	3	
Carbuncle ... ..	...	89	4	89	3	
153. Abscess ... ..	84	1,953	35	2,037	77	
Whitlow ... ..	1	44	1	45	3	
Cellulitis ... ..	46	734	94	780	64	
154. A.—Tinea ... ..	6	120	...	126	4	
B.—Scabies ... ..	41	1,728	...	1,769	71	
155. Other diseases of the skin ... ..	173	2,601	14	2,774	145	
Brythema ... ..	...	7	...	7	...	
Urticaria ... ..	1	41	...	42	...	
Eczema ... ..	12	447	1	459	22	
Herpes ... ..	1	83	...	84	3	
Psoriasis ... ..	...	9	...	9	...	
Elephantiasis ... ..	2	12	...	14	...	
Myiasis ... ..	...	1	...	1	...	
Chigoes ... ..	...	...	...	...	...	
Cutaneous leishmaniasis ... ..	...	10	...	10	...	
Others (including ulcers) ... ..	235	4,105	61	4,340	300	
X.—DISEASES OF BONES AND ORGANS OF LOCOMOTION (OTHER THAN TUBERCULOUS).						
156. Diseases of bones ... ..	3	32	4	35	2	
Osteitis ... ..	3	48	1	51	4	
157. Diseases of joints ... ..	...	1	...	1	...	
Arthritis ... ..	27	269	2	296	14	
Synovitis ... ..	5	136	1	141	4	
158. Other diseases of bones or organs of locomotion ... ..	13	300	9	313	13	

TABLE 1—(cont.)

## RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—(cont.)

Diseases.	* Remaining in hospital at end of 1926.	Yearly total.		† Total cases treated.	‡ Remaining in hospital at end of 1927.	Remarks.
		Admis- sions.	Deaths.			
XI.—MALFORMATIONS.						
159. Malformations ... ..	21	11	2	32	22	
Hydrocephalus ... ..	...	3	1	3	...	
Hypospadias ... ..	...	...	...	...	...	
Spina bifida, etc. ... ..	...	3	...	3	...	
XII.—DISEASES OF INFANCY.						
160. Congenital debility ... ..	4	29	16	33	...	
161. Premature birth ... ..	2	235	180	237	2	
162. Other affections of infancy ... ..	3	109	80	112	2	
163. Infant neglect (infants of three months or over) ... ..	...	37	19	37	2	
XIII.—AFFECTIONS OF OLD AGE.						
164. Senility ... ..	107	402	153	509	104	
Senile dementia ... ..	1	32	13	33	1	
Debility ... ..	...	3	1	3	1	
XIV.—AFFECTIONS PRODUCED BY EXTERNAL CAUSES.						
165. Suicide by poisoning ... ..	...	7	3	7	...	
166. Corrosive poisoning (intentional) ... ..	...	6	4	6	...	
167. Suicide by gas poisoning ... ..	...	...	...	...	...	
168. Suicide by hanging or strangulation... ..	...	8	7	8	...	
169. Suicide by drowning ... ..	...	2	2	2	...	
170. Suicide by firearms ... ..	...	...	...	...	...	
171. Suicide by cutting or stabbing instruments... ..	...	6	2	6	1	
172. Suicide by jumping from a height ... ..	...	...	...	...	...	
173. Suicide by crushing ... ..	...	...	...	...	...	
174. Other suicides ... ..	...	1	...	1	...	
175. Food poisoning... ..	...	14	1	14	...	
Botulism ... ..	...	...	...	...	...	
176. Attacks of poisonous animals... ..	...	3	...	3	...	
Snake bite ... ..	2	30	...	32	1	
Insect bite ... ..	...	33	...	33	...	
177. Other accidental poisonings ... ..	1	26	3	27	...	
178. Burns (by fire)... ..	8	171	16	179	10	
179. Burns (other than by fire) ... ..	4	239	10	243	4	
180. Suffocation (accidental) ... ..	...	...	...	...	...	
181. Poisoning by gas (accidental) ... ..	...	1	..	1	...	
182. Drowning (accidental)... ..	...	...	...	...	...	
183. Wounds (by firearms, war excepted) ... ..	1	39	5	40	2	
184. Wounds by (cutting or stabbing instruments)	85	1,752	29	1,837	74	
185. Wounds (by fall) ... ..	26	1,869	15	1,895	81	
186. Wounds (in mines or quarries) ... ..	11	304	2	315	20	
187. Wounds (by machinery) ... ..	2	205	3	207	8	
188. Wounds (crushing, e.g., railway accidents, etc.)	4	251	8	255	15	
189. Injuries inflicted by animals, bites, kicks, etc.	15	128	3	143	6	
190. Wounds inflicted on active service ... ..	...	...	...	...	...	
191. Executions of civilians by belligerents ... ..	...	...	...	...	...	
192. A.—Over fatigue ... ..	...	2	...	2	...	
B.—Hunger or thirst ... ..	...	4	...	4	...	
193. Exposure to cold, frost bite, etc. ... ..	...	...	...	...	...	
194. Exposure to heat—						
Heatstroke ... ..	...	1	...	1	...	
Sunstroke ... ..	...	2	...	2	...	
195. Lightning stroke ... ..	...	9	...	9	...	
196. Electric shock ... ..	...	1	...	1	...	
197. Murder by firearms ... ..	...	...	...	...	...	



TABLE 1—(cont.)

## RETURN OF DISEASES AND DEATHS (IN-PATIENTS) FOR THE YEAR 1927—(cont.)

Diseases.	* Remaining in hospital at end of 1926.	Yearly Total.		† Total cases treated.	‡ Remaining in hospital at end of 1927.	Remarks.
		Admis- sions.	Deaths.			
XIV.—AFFECTIONS PRODUCED BY EXTERNAL CAUSES—(cont.)						
198. Murder by cutting or stabbing instruments	...	5	5	5	...	
199. Murder by other means	...	2	2	2	...	
200. Infanticide (murder of an infant under one year)	...	...	...	...	...	
201. A.—Dislocation	5	69	3	74	7	
B.—Sprain	2	270	...	272	6	
C.—Fracture	70	1,047	93	1,117	111	
202. Other external injuries	65	1,791	20	1,856	59	
203. Deaths by violence of unknown cause	...	1	1	1	...	
XV.—ILL-DEFINED DISEASES.						
204. Sudden death (cause unknown)	...	...	...	...	...	
205. A.—Diseases not already specified or ill-defined	126	4,572	17	4,698	177	
Ascites	...	47	5	47	2	
Edema	1	84	2	85	1	
Asthenia	2	58	25	60	...	
Shock	...	32	20	32	...	
Hyperpyrexia	...	30	2	30	1	
B.—Malingering	...	25	...	25	...	
XVI.—DISEASES, THE TOTAL OF WHICH HAVE NOT CAUSED 10 DEATHS						
1. Pyrexia of unknown origin	6	823	27	829	8	
2. N.D.D. and under observation	67	1,697	...	1,764	72	
3. Accompanying	16	668	...	684	25	
4. Awaiting confinement	...	3	...	3	1	
5. Chicken-pox	...	4	...	4	...	
6. Panaphimosis	1	...	...	1	...	
7. Cholera contacts	...	30	...	30	...	
8. Admitted with patients	27	562	...	589	23	
9. Foreign body	...	6	...	6	...	
Total	5,107	136,987	11,743	142,094	6,296	

TABLE 2.

## MEDICAL STAFF ON 31st DECEMBER, 1927.

1	Principal Medical Officer
4	Senior Medical Officers
3	Chief Surgeons
1	Ophthalmologist Surgeon
21	Medical Officers
1	Anaesthetist
13	Lady Medical Officers (including 4 Infant Welfare)
1	Personal Assistant to the Principal Medical Officer
12	Deputy Medical Officers
11	Assistant Medical Officers
41	Assistant Surgeons
1	Staff Assistant, European Hospital, Kuala Lumpur
24	Dressers, Special Grade
73	Dressers, Grade I
254	Dressers, Grade II
73	Dressers, Grade III
87	Probationers
3	Matrons, Grade I
5	Matrons, Grade II
58	European Sisters (including 5 Infant Welfare)
100	Asiatic Nurses
21	Native Midwives

## HEALTH BRANCH.

1	Chief Health Officer
2	Senior Health Officers
13	Health Officers
2	Chief Sanitary Inspectors
6	Assistant Surgeons
4	Senior Health Inspectors, Grade II
11	Health Inspectors, Grade I
14	Health Inspectors, Grade II
15	Probationer Health Inspectors
1	Malaria Inspector.

## INSTITUTE FOR MEDICAL RESEARCH.

1	Director
1	Bacteriologist
1	Pathologist
1	Assistant Pathologist
1	Chief Chemist
4	Chemists
1	Entomologist
1	Malaria Research Officer
1	Research Student in Tropical Medicine
2	Assistant Surgeons
1	Librarian
1	Laboratory Assistant, Special Grade
1	Laboratory Assistant, Grade I
4	Laboratory Assistants, Grade II
6	Laboratory Assistants, Grade III
3	Probationers
1	Storekeeper



## CENTRAL MENTAL HOSPITAL.

- 1 Medical Superintendent
- 1 Assistant Medical Superintendent
- 3 European Male Attendants
- 2 European Female Attendants
- 1 Senior Assistant Physician
- 1 Assistant Physician
- 1 Second Assistant Physician
- 1 Inspector
- 1 Assistant Inspector
- 2 Dressers, Grade II
- 2 Dressers, Grade III
- 1 Matron
- 1 Work Mistress
- 2 Nurses
- 1 Steward
- 1 Storekeeper.

## VETERINARY BRANCH.

- 7 Veterinary Surgeons
- 5 Assistant Veterinary Surgeons
- 10 Veterinary Inspectors
- 7 Veterinary Assistants.

## VENEREAL DISEASE BRANCH

- 1 Venereal Disease Specialist
- 4 Assistant Surgeons
- 1 Nurse
- 2 Dressers, Grade II (Dispensary)
- 1 Dresser, Grade III (Laboratory).

## RADIOLOGICAL BRANCH.

- 1 Radiologist
- 1 Radiologist II
- 1 Assistant Surgeon
- 1 Dresser, Grade II
- 1 Probationer.

## APPENDIX A.

ANNUAL REPORT OF THE INSTITUTE FOR MEDICAL RESEARCH  
FOR THE YEAR 1927.

Great progress has been made during the past year in the construction of the extension laboratories which should be ready for occupation in the early months of 1928. The additional accommodation will enable the Malarial Research Division to be housed in the Institute, and will give a much needed increase of laboratory space to the Chemical Division. In the meantime, preparations for the moving of laboratory equipment have necessitated some curtailment of research activities, which will not be extended until divisions are installed in their new homes.

Before proceeding to the customary survey of the work in 1927, mention must be made of the recent retirement of the late Director, Dr. W. Fletcher, who had been associated with the Institute for Medical Research for some eighteen years. His researches in various fields of tropical medicine are so well known that review is superfluous, and his departure is a very real loss to the Institute.

## BERI-BERI.

The year 1927 was heralded by unusually heavy rains which resulted in extensive flooding throughout the country. Market gardens were washed out and consequently fresh vegetables became extremely scarce. Later in the year crops were adversely affected by a severe drought and a second serious shortage occurred. The period under review must thus be regarded as one of comparative vegetable famine.

Chinese consume polished rice in preference to the parboiled or undermilled varieties, and it would appear that they take the necessary quota of vitamin B. chiefly in the form of vegetables. It is of interest that a year of vegetable shortage should also be notable for a high beri-beri incidence. The large majority of cases were of Chinese nationality and many were young tin miners, who had but recently arrived in Malaya. These immigrants have a low standard of living, and enhanced prices would preclude the inclusion of any quantity of vegetables in their diet.

In the States of Perak and Selangor the increase in the number of cases has been marked throughout the year. On the East Coast, the floods were more severe, particularly in the States of Pahang and Kelantan where the outbreak of beri-beri was almost explosive in character and followed at an interval of three to four weeks after the rains. By the month of May, incidence showed a definite decline which coincided with the re-establishment of vegetable supplies. In these eastern states, flood levels in some of the valleys were over one hundred feet above the usual river levels. The population was destitute and relief foodstuffs were an urgent necessity. Much of the rice which was despatched to meet this emergency was of the polished variety, and beri-beri developed with surprising rapidity. The floods occurred in the last week of December, 1926, and the number of cases which came under observation in two areas of Kelantan are shown in the following table:

TABLE I.  
NUMBER OF BERI-BERI CASES ADMITTED TO HOSPITAL.

District.	Year.	January.	February.	March.	April.	May.	December.
Kuala Krai ...	{ 1927	26	24	27	29	15	—
	{ 1926	2	3	2	0	1	1
Kota Bharu ...	{ 1927	7	19	38	22	10	—
	{ 1926	0	1	3	5	0	—

During the rains and floods, practically all the rice stocks in these areas became sodden with water. Conditions should therefore have been suitable for the generation of rice "toxin", which of recent years has again received attention as a possible factor of etiological importance. But an analysis of the cases in the Kuala Krai area brings out an interesting point:

TABLE II.  
NUMBER OF BERI-BERI CASES IN KUALA KRAI AREA ARRANGED ACCORDING TO NATIONALITY.

Nationality.	December, 1926.	January, 1927.	February, 1927.	March, 1927.	April, 1927.	May, 1927.
Chinese ...	1	24	21	15	17	12
Malays ...	0	0	2	5	9	1
Tamils ...	0	2	1	7	3	2

Among the Chinese, the maximum number of cases occurred during the month following the flood, but the maximum was not reached for the Malays and Tamils until the fourth and third month respectively. It is difficult to accept that national idiosyncrasy could determine such widely differing intervals before the onset of symptoms, and the fact that the normal Chinese diet appears to be much nearer the starvation line for vitamin B. than that of Malays and Tamils is perhaps not without significance. The results of previous investigators who have approached the problem



of vitamin storage in the animal body have been inconclusive, and an experiment, undertaken with fowls to confirm this point, has failed to indicate such storage. Four fowls, fed on autoclaved polished rice, were given the minimum quantity of rice polishings extract daily to prevent polyneuritis. A second batch on a similar diet was given twice this quantity of the extract. After the experiment had proceeded for four weeks administration of extract was stopped, and the average time before the onset of polyneuritis was fourteen days for the first batch compared with twelve days for the second.

Another observation, which tends to discredit the toxin theory of causation, was made during the Kelantan outbreak. Rice stocks on a rubber estate were sodden with water for several days while employees lived on launches or rafts. Immediately after the floods subsided, the manager sent launches down-stream to collect vegetables from gardens which had escaped the floods, and supplies were retailed to the coolies at nominal charges. No cases of beri-beri developed among the labour force.

On a second estate rice stocks were kept quite dry throughout the flood period, but the vegetable gardens were washed out and no attempt was made to obtain supplies. Cases of beri-beri developed among the coolies.

The recorded observations on beri-beri in Kelantan were collected during a visit to that State in June last, and are due to the courtesy of Mr. G. E. Shaw, O.B.E., lately British Adviser, Dr. J. W. Geale of Kuala Krai, and the Kelantan Medical Department.

#### MARRIS' ATROPINE TEST IN BERI-BERI.

An unusual feature of the beri-beri cases in the past year has been the large predominance of the dry type. It was thought that Marris' atropine test for enteric fever might yield interesting results in such cases, and might even serve to differentiate beri-beri from the endemic dropsy of India if, as is sometimes claimed, the latter disease is a separate entity. In cases of enteric fever the injection of grs. 1/50 causes little acceleration of the pulse rate. An increase of less than ten beats is usually regarded as diagnostic; of from ten to twenty beats as doubtful, and enteric is negatived if the increase exceeds twenty beats.

Eleven cases of dry beri-beri have been tested. In two instances the increase was less than six beats; in three, between ten and sixteen, and in the remaining six cases the increase varied from twenty-one to fifty-three beats. Marris' test thus gives inconstant results in beri-beri, the alteration in pulse rate probably depending on the degree of involvement of the cardiac nerves.

#### BIOLOGICAL TESTS ON RICE.

At the request of the British Adviser, Kelantan, a test was carried out on Siamese "Loonzain" rice. None of the fowls to which this sample was fed developed polyneuritis gallinarum, although the experiment was continued for a period of eight weeks.

During the month of October a few cases of beri-beri developed among prisoners in the Seremban gaol. A bag of the rice used for the prisoners' food was obtained and fed to batches of fowls. Within six weeks one-third of the birds employed in the experiment developed polyneuritis.

#### VITAMIN B. EXTRACTS.

A large quantity of vitamin B. extract for the treatment and prophylaxis of beri-beri has been prepared by the Chemical Division during the past year. The final product is such that 2.5 cubic centimeters contain the vitamin equivalent of 5.0 grammes of rice polishings. The solution is bulky for transit and a more concentrated preparation would be advantageous. The publication of Jansen and Donath's method of extraction by adsorption with acid clay gives promise of an ideal preparation for distribution. Experiments were therefore commenced to determine the efficiency of adsorption, and Mr. H. Marsden, B.Sc., devised a method for the extraction of vitamin B. from rice polishings with an acid alcohol solution, and recovery from the solution by prolonged shaking with kaolin. Quantities were so arranged that one gramme of kaolin would adsorb the vitamin from 30 grammes of polishings, if the process were one hundred per cent. efficient.

The kaolin was made up into an emulsion which was given daily to batches of fowls by means of a stomach tube in doses containing the extract from 2.5 grammes, 3.5 grammes, 4.5 grammes of polishings respectively. Each batch consisted of four birds which were fed on a ration of autoclaved polished rice. All developed polyneuritis within thirty-seven days of the commencement of the experiment. As the protective dose of rice polishings is only 2.5 grammes daily, the method of extraction cannot be regarded as efficient. It may be that kaolin is a less effective adsorbent than acid clay. Supplies of the latter are being obtained and the experiment will then be repeated. If efficient extraction by adsorption can be devised and the product is a stable one, the method of Jansen and Donath will be an important advance in the preparation of bulk supplies of vitamin B.



## MALARIA.

## TREATMENT BY PLASMOCHIN.

During the early months of the year Dr. W. Fletcher completed his investigation of the therapeutic properties of this synthetic preparation. His conclusions were as follows:

"A series of ninety-seven patients, seventy of whom were Tamils and twenty-seven Chinese, were given 0.03 grammes of plasmochin, twice a day. The average weight of the patients was 48.2 kilogrammes (106 lbs.). Blood-films were examined daily and, at the same time, an enquiry was made as to the presence of toxic symptoms.

The patients with benign tertian malaria were under treatment for about six days in each case; those with quartan for eight days; those with subtertian, or mixed tertian for about ten days.

Forty-six men suffering from benign tertian fever were given plasmochin, with the result that the fever and the parasites disappeared by the fourth day in every case, with the single exception of a man in whom one trophozoite was found on the fifth day. Ten cases of quartan malaria were treated. The fever disappeared by the fourth day and the parasites, including gametocytes, by the fifth.

Twelve patients with mixed tertian malaria received a course of treatment. The benign tertian parasites quickly disappeared, but the subtertian rings persisted and the seven instances the exhibition of quinine was necessary because parasites were still present after a week's treatment with plasmochin. The results in subtertian malaria were disappointing. Twenty-nine patients were given plasmochin, but in twelve cases it became necessary to give quinine. The drug was not altogether without effect upon the subtertian parasites. In almost every case they diminished during treatment, in some they disappeared altogether; but, in others, they increased again, although the treatment was continued, and they became as numerous as they had been at the beginning.

Plasmochin appears to have the unique and valuable property of destroying subtertian gametocytes, but further investigation is necessary. The drug was given to twenty-one men who had crescents in their blood. In one case they persisted up to the tenth day of treatment, but in no other instance were they found later than the seventh day and, in the majority, they were not seen after the fourth day.

Plasmochin is tasteless and has none of the unpleasant by-effects of quinine. It is, however, more toxic than quinine. Cyanosis, ascribed by Manson-Bahr to methaemoglobinaemia, is the most common toxic manifestation. Two men in the group of ninety-seven became seriously ill during treatment, and also one patient who is not included in this series; but it is not certain that their symptoms were due to plasmochin. In two of the cases there was high fever and collapse; in one there was pain in the abdomen, diarrhoea, vomiting and acidosis. In two, there was slight cyanosis. Eleven patients were given 0.06 grammes of plasmochin daily for a period of ten days or longer, without the appearance of any toxic symptoms. Plasmochin should be administered under medical care, it is not suitable for sale to the general public or for the mass treatment of gangs of labourers; it is better fitted for the hospital than for the out-patient."

Professor Muhlens has recommended the exhibition of a combination of plasmochin and quinine in subtertian infectious on the ground that while quinine is acting on the schizonts, the plasmochin destroys gametocytes, and thus renders the patient non-infective to carrier anophelines. A clinical trial of this combination is in progress.

## RADION ALFA (FLUORESCENT RADIUM QUININE).

Radion Alfa is prepared by the Institute di Radio Eccitamento of Rome according to the directions of Dr. Pais. The preparation is said to be radio-active and it is claimed that this property is of therapeutic value in destroying the *Plasmodium* and in stimulating the immunity of the host. That the drug is radio-active was proved by Dr. R. Green who found that the emission of rays from a single layer of pills was sufficient to affect a photographic plate, if the exposure were continued for several hours.



In testing the curative value of such a compound it is advisable to control the investigation by cases treated with an equivalent dosage of drugs of known plasmodicidal action, which are contained in the preparation. To this end, an analysis was carried out by Mr. R. W. Blair, F.I.C., the Chief Chemist, and, based on his report, a quantity of control pills were prepared. These contained approximately the same quantity of quinine and methylene blue as Radion Alfa but were without radio activity.

The recommended dosage is two to four pills daily. Alternate cases of malaria admitted to hospital were given two Radion Alfa pills twice daily, or two pills containing the equivalent weight of quinine and methylene blue.

The results of treatment of subtertian, benign tertian and mixed infections are given in the following tables:

TABLE III.  
RADIUM QUININE PILLS.

—	No. of parasites per 100 fields on admission.	Dose.	Last day on which fever present.	Last day on which parasites present.	Remarks.
Mixed Tertian (B.T. & S.T.)	15 S.T. 1 Crescent...	2 pills twice daily	12	15	B.T. parasites seen on 11th day. On 12th day quinine given
" " ...	850 B.T. & S.T. ...	2 " ...	15	15	On 12th day quinine given
" " ...	77 B.T. ...	2 " ...	3	6	Crescents present on the 15th day
B.T. & Quartan ...	15 B.T. & Quartan ...	2 " ...	0	12	
Benign Tertian ...	13 B.T. ...	2 " ..	3	4	
" " ...	14 " ...	4 " ...	0	2	
" " ...	17 " ...	4 " ...	3	4	First 3 doses 2 pills only. Absconded on the 4th day
Subtertian ...	3 S.T.R. ...	4 " ...	1	3	Crescents present on the 14th day
" ...	15 " ...	4 " ..	0	4	
" ...	200 " ...	4 " ...	2	3	Crescent present on 8th day
" ...	10 " ...	4 " ...	1	3	Crescents present on the 5th day. Absconded on the 5th day
Quartan ...	12 Quartan ...	4 " ...	1	5	Left the hospital on the 6th day

TABLE IV.  
CONTROL CASES.  
METHYLENE BLUE QUININE PILLS.

—	No. of parasites per 100 fields on admission.	Dose.	Last day on which fever present.	Last day on which asexual parasites present.	Remarks.
Mixed Tertian (B.T. & S.T.)	60 B.T. & S.T.R. ..	2 pills twice daily	14	17	Quinine on 16th day
" " ...	45 " " ...	2 " ...	8	10	Quinine on 7th day
" " ...	100 " " ...	4 " ...	6	7	First 3 doses 1 pill each
Benign Tertian ...	13 B.T. ...	4 " ...	1	3	
" " ...	18 " ...	4 " ...	1	4	First 3 doses 1 pill each
" " ...	90 " ...	4 " ...			
Subtertian ...	1 Crescent & 12 S.T.R.	2 " ...	0	14	Left " hospital " on the 14th day
" ...	30 S.T.R. ...	2 " ...	0	3	
" ...	50 " ...	4 " ...	10	14	Left hospital on the 14th day
" ...	300 S.T.R. & 1 Crescent	4 " ...	3	3	Crescents on 10th day
" ...	8 S.T.R. ...	4 " ...	0	2	

Neither Radion Alfa nor the control mixture appears to be efficacious in the dosage advocated by the manufacturers, and, even when this dose was doubled, the plasmodicidal action is disappointing. The quantities of quinine and methylene blue in Radion Alfa are too small to control infections, and, by comparison with the results of treatment with a similar dosage of quinine and methylene blue only, it would appear that the addition of the radio-active substance does not materially increase the therapeutic value.

#### THE EFFECT OF THE EXHIBITION OF QUININE ON SERUM BILIRUBIN.

In an investigation of serum bilirubin in cases of malaria infection, it was found (1925) that the intravenous administration of quinine was followed by a rise in bilirubin content during the succeeding twenty-four hours. A similar finding was also obtained with a number of cases of subtertian infection after the ingestion of quinine. The increase was shown to be haematogenous in origin and it was suggested that the phenomenon was consequent upon the haemolysis of infected erythrocytes by the action of quinine. Manson-Bahr has put forward an alternative and very feasible explanation. He suggested that the rise might be due to the action of quinine on involuntary muscle; that contraction of the unstriated muscle of a heavily infected spleen might cause the expulsion of a quantity of toxin into the systemic circulation, thus bringing about considerable haemolysis and leading to an increase in the serum bilirubin. Pituitary extract has a more definite action than quinine on involuntary muscle, and this interesting hypothesis has been put to the test by the injection of the extract in cases with malarial infection. The following table includes the reading of serum bilirubin (indirect test) at intervals before and after the injection of 9.5 c.cms. of extract.

TABLE V.

Type of Malaria.				Spleen.	Serum Bilirubin.			Units.		
					Before injection.			After injection.		
					24 hrs.	½ hr.	1 hr.	3 hrs.	5 hrs.	24 hrs.
Benign Tertian	...	...	...	+++	1.7	1.7	1.7	1.6	1.7	1.6
"	...	...	...	+	0.9	1.5*	1.5	1.4	1.4	1.5
Subtertian	...	...	...	+	0.9	0.8	0.8	0.8	0.7	0.8
"	...	...	...	+	0.7	0.8	0.7	0.7	0.7	0.8

The exhibition of pituitrin which causes powerful contraction of unstriated muscle, is not followed by an increase in serum bilirubin, and hence it would appear that the increase which follows the intravenous injection of quinine is probably due to a haemolytic action of the drug.

The question of the serum bilirubin increase following the exhibition of quinine has been subjected to further examination during the year. Although a rise in haematogenous bilirubin has constantly been noted after intravenous administration in benign and subtertian infections, it has been demonstrated in a portion only of subtertian and benign-tertian cases after the ingestion of quinine.

#### THE PRECIPITIN TEST IN THE DIAGNOSIS OF MALARIA.

A technique for a precipitin test for malaria has been described by Talioferro, Talioferro and Fisher during the past year. Their antigen was prepared from heavily infected blood or placental tissue by extracting with ether and digesting the insoluble portion in Coca's solution (Sodium chloride 0.5 per cent., Sodium bicarbonate 0.05 per cent., and Phenol 0.4 per cent. in distilled water). It is claimed by the authors that upwards of eighty per cent. of the serums of fifty-four infected persons yielded definitely positive results. We have prepared antigen by this method, but from heavily infected spleen pulp obtained at autopsy, and results of tests have been disappointing. Better success has been achieved with an antigen prepared from spleen pulp using an alcoholic extract of the ether insoluble residue. When this alcoholic extract was allowed to stand on ice, a precipitate formed which was separated by filtration and taken up with saline. An opalescent solution resulted after filtration which has very definite antigenic properties. It is the most promising antigen we have as yet obtained, but occasional serums from non-malarial cases have given slight reactions.

#### BLACKWATER FEVER.

One case of blackwater fever was seen in a Tamil patient. Subtertian parasites were present in films of the peripheral blood. The urine contained considerable albumen, and haemoglobin was identified spectroscopically.

\* A rigor occurred about 12 hours before this reading.



## TROPICAL TYPHUS.

Weil-Felix reactions, to a total of 1927, were carried out last year, and 106 cases of tropical typhus were thereby diagnosed. The serums of ninety-seven cases agglutinated the "K" strain of *Proteus* X 19; the remainder the "W" strain. No less than forty-six of the "K" cases occurred on one oil-palm estate.

## ANIMAL PASSAGE.

Previous attempts made at this Institute to infect guinea-pigs with the virus of Tropical Typhus by inoculation of patients' blood had been attended with inconclusive results. In the latter months of the year attempted passage was repeated, Belgian hares, guinea-pigs, and rats being the animals used. Since a succession of cases of this mild form of typhus has occurred on a Selangor estate from which came three cases of tsutsugamushi disease, it was thought that rats, which are probably the local reservoirs of tsutsugamushi virus, might also be reservoirs of typhus virus; and if this were so, inoculation with the blood of patients suffering from typhus fever might be more successful than in the case of guinea-pigs. To minimise as far as possible the using of rats that might chance to be immune, only rats caught in the town area were used. The investigation is as yet incomplete, but the results are encouraging.

The general outline of the procedure adopted was that blood drawn from a typhus patient, on the earliest day of fever that was possible, was inoculated intra-peritoneally into two rats, one Belgian hare and one guinea-pig. The temperatures of these animals were taken daily, and where, about the 8th-11th day, a rise in temperature occurred, sufficiently definite and prolonged to suggest successful passage of the disease, the animal was killed, a post-mortem made, and two emulsions prepared, one of the brain, and one of the spleen and kidney. Each emulsion was inoculated into further rats, Belgian hares and guinea-pigs by the intra-peritoneal route. At the outset the intra-cerebral and sub-cutaneous routes were also employed, but found to be inferior to the intra-peritoneal route.

Patient I was an overseer on an oil-palm estate. His Weil-Felix reaction was positive, the strain "Kingsbury" of *B. proteus* X 19 being agglutinated in a dilution of one in 1,920 on the 26th day. On the 7th day of illness two c.cms. of his blood were inoculated into a rat; and this, eleven days later, was found dead. Brain and spleen-kidney emulsions were passed on, as outlined above, to other animals. Of these, one guinea-pig, inoculated with spleen-kidney emulsion, developed on the 10th day a temperature of 104°F. which continued until the 15th day, when it began to fall. The animal was therefore killed, and an emulsion of its brain inoculated into four guinea-pigs. In one of these a slight but definite rise of temperature occurred on the 12th day and lasted till the 18th day; in the other three the temperature rose to 105°F.—105.2°F. on the 8th day, remained high for two days, and then fell by lysis to reach normal (99.9°F.) on the 15th day. One of them was killed after two days fever and emulsions passed on to two further guinea-pigs. These, however, showed no rise of temperature.

Patient II was a weeding coolie on the same oil-palm estate. His blood gave a positive Weil-Felix reaction in a dilution of one in 7,680 on the 19th day of illness. On the eleventh day two rats, one guinea-pig, and one Belgian hare were inoculated with his blood. Of these one rat only showed a characteristic rise of temperature. On the 9th day after inoculation the temperature rose from 100°F. to 101.6°F. on the 10th day, and on the 11th day reached 103.8°F. On the 12th day it reached 104°F., and the animal was killed. The usual passages were made to other animals; of these the Belgian hare and guinea-pig showed no definite fever, one of the two rats showed a rise of temperature of only 1.5°F. on the 9th day, which fell to normal on the 13th day; the temperature of the other rat rose on the 9th day to reach 103.6°F. on the 12th day. On the 14th day, the temperature being 102.4°F., the animal was killed, and the usual passages made, this time unsuccessfully, no rise of temperature being found in any of the animals.

Patient III was another weeding coolie from the same estate. The Weil-Felix reaction was positive in a dilution of one in 1,920 on the eighteenth day of illness. On the 9th day a rat was inoculated, and twelve days later the temperature began to rise, reaching 103.2°F. on the 13th day. The animal was killed next day, and the usual passages made to further animals. Of these, the guinea-pig and Belgian hare gave no rise of temperature; but the temperature of one of the rats rose to 102.6°F. on the 10th day and continued high, to reach 103.6°F. on the 16th day, when the animal was killed. Further passages were made, the results of which are not yet available.

Patient IV was also a weeding coolie on the estate. His Weil-Felix reaction was positive, one in 480 on the 17th day. A rat inoculated on the 4th day of illness showed a rise of temperature of only one degree twelve days later.



## THE WEIL-FELIX REACTION IN INOCULATED ANIMALS.

In the case of two guinea-pigs, the temperature of which had shewed the characteristic rise on the 10th day after inoculation, blood was drawn three weeks later for the Weil-Felix test. In each case the agglutination occurred in a dilution of 1 in 60, thus falling within normal limits, as shewn by control tests.

In the case of two rats, the temperature of which had risen sharply on the 11th day after inoculation, blood drawn four weeks later gave a Weil-Felix result of only 1 in 10.

## AUTOPSY FINDINGS.

At post-mortem the significant findings were broncho-pneumonia, pulmonary congestion, and splenic enlargement. In one animal the microscopic appearance of both lungs somewhat resembled that seen in cases of influenzal pneumonia; in two others there was pulmonary congestion.

In four of the rats the spleen weights, calculated as a percentage of the body weights, were respectively 0.75 per cent., 0.85 per cent., 1.05 per cent. and 0.14 per cent. For comparison, the corresponding figure was determined in 48 uninoculated rats and the average found to be 0.22 per cent. Thus infection is generally accompanied by a considerable increase in the spleen ratio. In the one exception (ratio 0.14 per cent.) there was reasonable doubt of successful infection. Although the temperature was 103.6°F. when the animal was sacrificed, the rise commenced on the 16th instead of the 10th to 12th day, and all attempted passages with the brain and spleen and kidney had negative results.

## CULTURAL FINDINGS.

In an attempt to demonstrate, and if possible, to isolate *Rickettsia* bodies, cultures on glucose-agar, and direct smears were made at post-mortem from brain, kidney, spleen and heart-blood.

Two cultures of brain, two of kidney, and three of heart-blood shewed after three to four days a definite growth of minute, dry, discrete colonies. On staining with Giemsa two types of organisms were to be seen, viz.:

- (1) Long rods staining faintly blue, along the course of which, at equidistant intervals were more darkly staining granules. In some instances these granules were purple in colour. The length and shape varied, some rods having only four such, others having six or seven; some being straight and others curved. Similar organisms were also obtained, however, in cultures from the blood of apparently normal rats.
- (2) Spindle-shaped bacilli, about 3.5 in length, shewing bi-polar staining. The morphology of these organisms appeared to be similar to that illustrated by Anigstein in his monograph (1927). In direct smears of spleen and heart-blood they were also demonstrated. As they proved to be partially gram-positive, which is contrary to the experience of other workers, their identity is uncertain.

## JAPANESE RIVER FEVER.

Two probable cases of Japanese river fever have been reported in the past year. We are indebted to Dr. D. Bridges, the State Surgeon, Kedah, for notes of the first, the patient being a European Rubber Restriction Officer in the service of the Kedah Government. He was admitted to hospital complaining of continuous fever of a week's duration. Temperature ranged between 102°F. and 104°F., and blood examination for malarial parasites was negative. A small ulcer with a black necrotic centre was noted on the inner aspect of the left calf. Lymphatic glands were enlarged, discrete and painful. On the day following admission a rash was seen on the chest and abdomen.

Widal and Weil-Felix reactions were carried out on the eleventh and seventeenth day of illness with negative results except that on both occasions *B. proteus* X 19 (K) was agglutinated to a titre of 1/60. At the time of taking the second specimen the patient was well on the way to recovery.

The diagnosis in the second case is less certain. The patient was a Tamil labourer from a Selangor rubber plantation who had been ill for three days with high temperature, headache and definite pains, before seeking admission to hospital. Fever was remittent in type. There was marked tremor of tongue; reflexes were sluggish; conjunctivae were injected, and slight bronchitis was present. On the 16th day of illness he had muttering delirium from which he could be easily roused to answer simple questions. In the fold of the left groin a circular ulcer, about quarter of an inch in diameter, was seen. It was covered by a black eschar which was detached with difficulty, leaving a punched out ulcer with sharply defined edges and a smooth



base. The neighbouring glands were enlarged and slightly tender. Blood cultures were negative and cerebro-spinal fluid showed no abnormality. The urine contained albumen. Widal and Weil-Felix reactions were carried out. The former was quite negative but the latter, performed with the A2, Metz. Syric, Warsaw and Kingsbury strains of *B. proteus* X 19, had interesting results. Strain A2 was agglutinated at 1/30 titre on the 19th day; at 1/60 on the 23rd day; and 1/120, on the 26th day and at 1/130, on the 34th day. With the "K" strain, agglutination occurred at 1/160 titre on the 10th day; at 1/240, on the 16th day; at 1/480 (incomplete), on the 19th day; at 1/240, on the 23rd day; at 1/120, on the 26th day, and 1/60, on the 34th day.

Despite the presence of the ulcer, which appeared typical of Japanese river fever, it may be that this case was one of tropical typhus, though agglutination of *B. proteus* X 19 occurred only in comparatively low dilutions and agglutinins fell rapidly.

#### THE LOCAL VECTOR.

During the year the elucidation of the causation of this fever has progressed further. Since the frequent outbreaks of the disease in Japan and Sumatra have been traced to the bite of certain types of *Trombiculae*, which live in the ears of rats and mice infesting the affected areas, the presence of similar *Trombiculae* was sought in Selangor.

The "tungau", small, red, six-legged mites (*Trombiculae*) which frequently attack the Malay school-boy by burrowing into the skin, were found to be identical with the larval form of the *T. pseudo-akamushi*, described by workers in Japan and Sumatra. They were also found in large numbers on fowls, goats, and rats. Apart from local irritation at the site of burrowing, they cause no ill-effects to their host. Four hundred and sixty-two rats have been examined by Dr. R. Lewthwaite; of these, ninety-five came from the estate on which tsutsugamushi disease had occurred, two hundred and seventy-six rats were caught in the town of Kuala Lumpur, and ninety-one on neighbouring estates and jungle. Two-thirds of the total number were found to carry mites in the ears; and reference to the published descriptions of Nagayo and Walch proved these to be *T. deliensis*, *T. oudemansi*, *T. pseudo-akamushi*, and *T. muria*.

The *T. deliensis* has been shewn by Walch and Keukenschrijver to convey the virus of tsutsugamushi in Sumatra, and it is therefore significant that of the twenty-eight rats found to harbour this mite, twenty-four should have been caught on the particular estate whence the Selangor cases of the disease came; and, further, that of these twenty-four, nineteen should have been caught in the very circumscribed area of the estate in which the victims were bitten.

The remaining four rats harbouring *T. deliensis* were caught on estates also; none were found on the town rats. It is of interest to note the proportion of rats harbouring *T. deliensis* to the total number of rats caught at different times of the year. In May, seven out of seventeen rats carried the mite; in June, eight out of eighteen; but in November only three out of eighteen, and in December one out of sixteen. Such figures suggest a life-cycle of *T. deliensis* parallel with that of the very closely allied *T. akamushi*, described by Nagayo and others. This mite, which by its bite causes the annual outbreaks of river fever in Japan, appears in its larval form only in June, multiplies during the following three months, and disappears about the end of October, passing into the next stage of its life-cycle, the nymphal form, which does not suck blood and would therefore no longer infest the rat. Until rats from the affected Selangor estate have been examined for a complete year, the parallel cannot be established with certainty.

Of other types of mites identified, *T. oudemansi* was found only on estates, whereas *T. muris* and *T. pseudo-akamushi* were found both on estate rats and town rats. Mites almost identical with the *T. akamushi* of Japan were found on one rat from the area in which the patients had been bitten. Specimens were sent to Dr. Walch, of Welterveden, who had wide experience of the disease while in Sumatra. He very kindly examined them and agreed as to their close identity with *T. akamushi*, the width of the scutum alone differing. Until a large number of specimens have been obtained it will be impossible to assert with certainty whether or not this mite belongs to a new genus.

Amongst town rats at least three types of mite have been found that appear to be new. As opportunity offers their details will be worked out and their identification thereby established.

In June Dr. R. Lewthwaite visited Sumatra to confer with Dr. N. C. R. Keukenschrijver on the subject of Tsutsugamushi, and we desire to record our grateful appreciation of the assistance which was derived from his experience of previous epidemics.



## ENTERIC FEVERS.

Specimens of blood on which Widal reactions were performed numbered 1,365, with the following positive results :

<i>B. typhosus</i>	...	...	...	...	...	224 specimens
<i>B. paratyphosus A</i>	...	...	...	...	...	4 „
<i>B. paratyphosus B</i>	...	...	...	...	...	3 „
<i>B. paratyphosus C</i>	...	...	...	...	...	1 „

Diagnosis was based on the agglutination curve in seventy-one cases of typhoid, four cases of paratyphoid A, and three cases of paratyphoid B; and on a single examination with agglutination above the 1/480 titre in eighty-six cases of typhoid. From these, the causative bacillus was isolated from excreta in fifty cases of typhoid, and from one case each of paratyphoid B and C.

The hospital distribution of the cases was as follows :

Perak—37 cases (Taiping, 7; Ipoh, 13).

Selangor—34 cases (Kuala Lumpur, 22).

Negri Sembilan—31 cases (Seremban, 12; Kuala Pilah, 8).

Pahang—6 cases.

A CASE OF *B. PARATYPHOSUS C* INFECTION.

A case which was eventually diagnosed as a *B. paratyphosus C* infection, was admitted to hospital complaining of fever, cough, giddiness and some oedema of the feet. The spleen was enlarged and the usual routine examination resulted in the finding of *Ankylostome* ova in the faeces and subtertian parasites in the blood. Quinine was exhibited but the temperature failed to respond, and blood was submitted for a Widal reaction on the thirteenth day of illness. The test was negative for *B. typhosus* and *B. paratyphosus B* but *B. paratyphosus A* was agglutinated in low dilutions. On the eighteenth day the Widal reaction was repeated. Agglutinins for *B. paratyphosus A* had fallen, but cultures from the urine yielded an organism of the typhoid group, which on investigation proved to be *B. paratyphosus C*. The patient recovered.

## THE ATTEMPTED STERILIZATION OF A CARRIER.

A small outbreak of enteric which occurred in a construction camp was traced to a carrier, and certain investigations were undertaken on that individual. When admitted to hospital *B. typhosus* was present in his stools, although no history of previous continued fever could be elicited. Twenty c.cms. of a 0.05 per cent. solution of mercurochrome were given intravenously on three successive days, during which time the faeces were very definitely coloured by the dye. Daily cultures were made for a period of a month following treatment, and in no case was *B. typhosus* isolated. The patient was of Chinese nationality and it is, unfortunately, improbable that he will be traceable for further cultures after an interval of some months.

## A SKIN REACTION FOR THE IDENTIFICATION OF CARRIERS.

A skin reaction for the identification of carriers would be of value for the rapid tracing of many outbreaks of enteric fever to their source, and would serve to eliminate much laborious cultural work. The possibility of such a reaction was therefore explored. A broth culture of *B. typhosus* was kept in the incubator for seven days, after which it was filtered and the filtrate stored on ice. By a series of preliminary tests, it was established that the intra-dermal injection of 0.2 c.cms. of a 1 in 100 dilution of the filtrate was sufficient to cause a definite cutaneous reaction in normal individuals. In the case of the carrier, the injection was followed by the development of a very circumscribed zone of oedema and hyperaemia which had commenced to fade within twenty-four hours.

With control cases, the reaction was best marked after an interval of twenty-four hours, when the oedema and hyperaemia involved an area of some half to one-and-a-half inches in diameter. Within forty-eight hours all signs of reactions had disappeared, leaving some discolouration in the immediate vicinity of the site of injection. A similar difference was noted in a case that had typhoid fever six years previously, and was known to have been a carrier for a period of twelve months, though cultures were negative at the time of the test.



Very few reactions have been carried out on vaccinated persons, but in two instances, inoculated four and eight years before, respectively, the reactions were similar to those of negative controls.

The number of carriers coming under observation is too small to allow of conclusions in regard to the value of the test. The carrier state has been produced in a number of rabbits by the direct inoculation of *B. typhosus* into the gall bladder and pelvis of the kidney. Experiments are being continued on these animals.

#### TUBERCULOSIS.

The prevalence of tuberculosis among the indigenous peoples is a matter for serious consideration. There is no bovine tuberculosis and practically every case must arise from a human source. Ignorance of the elements of hygiene renders the population careless of infection, and, despite active propaganda, there is little abatement of the spitting evil.

In view of the common belief that glandular and bone tuberculosis infections are generally due to the "bovine" type of bacillus, an analysis of recent autopsy findings is not without interest on account of the freedom from infection of local cattle. In seventy cases of tuberculosis the number of times various parts were found to be infected is given below:

Lungs, 67; bronchial glands, 66; pleura, 58; mesenteric glands, 23; cervical glands, 20; small intestine, 19; peritoneum, 11; large intestine, 9; kidneys, 5; spleen, 4; meninges, 4; larynx, 4; other glands, 3; bone, 2; liver, 2.

An investigation of local strains of *B. tuberculosis* has been in progress for a few months only. Petroff's medium has been successfully employed for primary culture and a number of direct guinea-pig inoculations have been performed. After injection the weights of the animals have steadily decreased for the first four weeks, after which there has been some increase for a short period, followed by a progressive fall.

For purposes of animal experimentation, we have obtained a culture of the B. C. G. strain of *B. tuberculosis* for which we are indebted to the Director of the Pasteur Institute, Saigon.

#### TREATMENT WITH SANOCRY SIN.

A number of cases have been treated with Sanocrysin in order to gauge its effect on the rapid course which is usually characteristic of the disease in the Asiatic.

*Selection of Cases.*—The early exudative type of pulmonary tuberculosis has been reported to have benefited most by Sanocrysin treatment. But, in Malaya, patients in so early a stage of the disease rarely seek admission to hospital; of the eleven cases under observation three only were of this type. Three advanced cases of pulmonary tuberculosis were selected, since a few apparently hopeless cases have been reported to have been greatly improved. Two cases of tuberculosis of the cervical glands were also selected. The remaining cases were of the fibroid pulmonary type. All the patients were adults; three were Tamils, eight were Chinese.

*Dosage Employed.*—The serum introduced by Mollgaard to counter the excessive reactions due to large and frequent doses of Sanocrysin was not used, since the more recent system of smaller and graduated dosage was employed. The graduation of dose was 0.1 gm., 0.25 gm., 0.37 gm., 0.5 gm., 0.62 gm., 0.75 gm., and 1.0 gm., at weekly intervals. A complete course was planned to include twelve injections. It was soon evident, however, that the drug caused very varying reactions in different patients, so that neither a fixed number of doses, nor strict graduation, could be adopted in every case. Each dose was dissolved in 10 c.cms. of distilled water, and given intravenously. Before the commencement of treatment the chest of each patient was radiographed (Dr. C. F. Constant). Patients were weighed the day before each injection; the day after injection the sputum was examined microscopically, and the number of *B. tuberculosis* noted per hundred fields. Daily examinations of urine were carried out for the detection of albuminuria.

#### Reactions and Contra-Indications.

*Headache and Giddiness.*—These symptoms were common, of short duration, and unimportant.

*Nausea and Vomiting.*—All patients complained of nausea, and all but two vomited within a short time of one or other of the injections; the intervening period being in some instances a few minutes only, in others a few hours. In two of the advanced cases the vomiting was so distressing that, to avoid doing more harm than good by the drug, the subsequent dosage was reduced until greater tolerance had been established. In other cases the vomiting was slight only, and no alteration in dosage was necessary.



*Rise of Temperature.*—This occurred after the first injection in every case; in some recurring daily for four or five days, in others not recurring; in some being a rise of 1.°F. only, in others 4.°F. Following each succeeding injection the rise was less and less marked, until, after the sixth injection, it occurred only in the very advanced cases, or in cases with severe reaction and toxic symptoms.

*Itching of the Skin.*—Five patients complained of this on the day following an injection. In three of them it was transitory, and treatment was not interrupted; in two it was accompanied by other symptoms. In none of the cases did it recur.

*Erythema.*—In two instances an erythematous itchy rash appeared on the chest on the second day after an injection, but faded in forty-eight hours. In a third case, following the seventh injection (1.0 gm.) a much more extensive rash appeared on the face, chest, back, legs and arms; it was erythematous and papular, confluent on the inner aspect of the legs, and caused much irritation. After remaining intense for five days it faded gradually, to disappear finally after fourteen days. Later there was a shedding of fine silvery scales. Severe stomatitis aggravated this reaction. Two intravenous injections of Thiostab (0.45 gm.) were given, and administration of Sanocrysin stopped for four weeks. Three small doses—0.25 gm., 0.37 gm.—have since been given, with no recurrence of reaction.

*Affections of the Mouth and Throat.*—Many of the patients complained of a metallic taste following the larger injections. Usually this was transient; but in three cases stomatitis developed. In the most severe case the buccal mucous membrane, especially that of the lower lip, was oedematous, hyperaemic, and intensely painful; on both sides of the soft palate, on the lower lip, and on the inside of the cheeks small superficial ulcers developed. In the two less severe cases the manifestations were similar, but milder. The soft palate was not involved and the condition yielded more quickly to cessation of Sanocrysin treatment and injection of Thiostab. The majority of the patients have complained of an itching sensation in the throat after the initial doses. After the later and larger doses this did not occur. As it passed off in a day or two, it did not contra-indicate treatment.

*Anorexia.*—In most cases loss of appetite developed after the larger doses, with consequent loss of weight. That this was due to the drug, and not merely to the achylia of pulmonary tuberculosis, was shewn in certain instances by a gain in weight after temporary reduction in the dose.

*Albuminuria.*—In every patient albumen was found in the urine after the larger doses. Usually it disappeared within seven days; but when it persisted markedly the drug was withheld.

*Respiratory Distress.*—In two advanced cases a sudden tachypnoea developed. In one of them, after two doses of 1.0 gm. of the drug had been tolerated, a third similar dose caused within an hour an increase in respiration rate of from 20 to 60 per minute. No alteration in the physical signs of the lung was found. In the other case, following the first injection of a maximum dose (1.0 gm.) a similar rise of respiration rate to 60 per minute occurred during the next few hours; and the condition of both lungs was aggravated. In the former case administration of Sanocrysin was interrupted for five weeks, but has since been recommenced, with no recurrence of reaction. In the latter and more advanced case no resumption was possible; after a temporary improvement the patient declined, and died five weeks later.

*Results of Treatment.*—These are not final, since no patient has yet completed a full course.

*Cases Much Improved.*—Two patients have gained six pounds in weight and have lost their cough; no tubercle bacilli have been found in the sputum for the last five and eight examinations respectively.

*Cases Slightly Improved.*—Two patients have gained in weight: but in one the cough persists, in the other tubercle bacilli are still to be found in the sputum.

Two cases have remained stationary.

Four cases have declined.

The eleventh case was one of tuberculous adenitis of the cervical glands, uncomplicated by pulmonary tuberculosis. Sanocrysin treatment for seven weeks has caused no diminution in size of the glands. This failure is apparent in a similar case, although an associated pulmonary tuberculosis shewed slight improvement.



In two cases the lung affection was accompanied by tuberculous laryngitis. In one of them, in which the lung affection was early, hoarseness of voice has almost disappeared. In the other, in which the lung affection was advanced, the drug seemed to aggravate the laryngitis, and owing to rapidly increasing pain in swallowing, treatment was abandoned after five injections. In both these cases "absolute silence" treatment was enforced.

*Conclusions.*—It would be premature to generalise on the results of Sanocrysin treatment but our observations would seem to justify the following conclusions :

- (1) Early cases of pulmonary tuberculosis may show striking improvement; they appear better able to tolerate the drug than advanced cases.
- (2) Treatment should be given cautiously to advanced cases, because of their great liability to severe reactions, which are likely to accelerate the course of the disease.
- (3) The maximum dose of Sanocrysin for a Tamil or Chinese should not exceed 0.75 gm.
- (4) Cases of tuberculous cervical adenitis are not benefited by the drug.

#### THE TREATMENT OF BACILLARY DYSENTERY BY BACTERIOPHAGE.

Dr. Fletcher reported in the preceding Annual Report that the administration of a bacteriophage, kindly supplied by Dr. F. d'Herelle for the treatment of dysentery, had little apparent influence on the course of the disease caused by *B. dysenteriae* (*Flexner*). The majority of local dysenteries are due to infection with this type of bacillus, and the administration of a satisfactory bacteriophage would probably reduce both the duration of hospital treatment and the mortality among the patients.

Attempts were therefore made to isolate active bacteriophage from convalescent cases, but although several were obtained with some action on the bacilli, efforts to increase virulence by passage were unavailing, and it appeared that a bacteriophage active against one strain of the *Flexner* bacillus was frequently almost impotent against other strains belonging to the same serological group.

Dr. d'Herelle, who had been invited by Government to visit Malaya in order to investigate the problem, arrived in Kuala Lumpur in October, bringing with him several bacteriophages active against *Flexner* strains. He immediately proceeded with the treatment of cases by oral administration of bacteriophage, and with the isolation of strains from convalescent cases. Unfortunately his activities were curtailed by an unusually low admission rate for dysentery cases in the Kuala Lumpur hospitals during his stay. Dr. d'Herelle concluded from his observations that the results of treatment of local cases with a stock bacteriophage were somewhat disappointing, and that the infecting *Flexner* strains tended to fall into groups against which different bacteriophages were active. A similar phenomenon has been reported in connection with *B. typhosus*, and he suggested that by the isolation of numerous bacteriophages it would be possible to obtain a polyvalent preparation which should be of use in the treatment of the majority of infections.

#### LEPTOSPIROSIS.

Twenty-two cases of this infection were observed during the past year—one European, one Malay, three Chinese and seventeen Tamils.

Prior to Dr. Fletcher's departure, he was engaged on an exhaustive study of the local *Leptospira*. A large number of strains were isolated, and with these, and others kindly forwarded by Dr. H. Noguchi, Professor Inada, and Dr. C. C. Okell, he carried out a series of Pfeiffer reactions in order to determine if local strains belonged solely to the *L. icterohaemorrhagiae* group. It was found that the local organisms could be divided into several clear-cut groups.

Dr. Fletcher examined local water supplies, which are obtained by the impounding of jungle streams with protected catchment areas. Of six samples examined, one proved positive for *Leptospira*, but the strain was not pathogenic for guinea-pigs.

The examination of rats by culture from the kidneys has also been undertaken. Of seventy-three caught on an oil-palm estate, thirteen (18 per cent.) were found to be carriers, while of seventy-six caught in Kuala Lumpur, not one was infected.

Attempts to carry the virus from guinea-pig to guinea-pig with *A. argenteus* and *A. albopictus* proved unsuccessful. After initial feeding on infected animals with numerous *L. icterohaemorrhagiae* in the peripheral blood, the mosquitoes were fed on young guinea-pigs every second day for three weeks. These guinea-pigs developed no clinical sign of infection and their serums failed to agglutinate cultures of the organism. Dissection of the surviving mosquitoes and examination of stained films failed to show *Leptospira*.



## DIAGNOSIS.

The milder forms of leptospirosis present many difficulties in clinical diagnosis and laboratory aid by culture and animal inoculation is tardy in the production of result.

It has been noted that *Leptospira* are sometimes seen in films of the peripheral blood stained by Fontana's method, and of the five last consecutive cases admitted to the District Hospital, Kuala Lumpur, Mr. K. Kanagarayer has succeeded in obtaining positive results in four. One was positive on the second day, two on the fourth day, and one on the fifth day of disease. The examination of blood films appears to be a useful means of arriving at an early diagnosis.

## THE TREATMENT OF ASTHMA AND HAY FEVER WITH EPHEDRINE.

Asthma and hay fever are scourges which have an unusually high incidence. Treatment with ephedrine has recently achieved a certain vogue in America and Dr. R. Green has carried out a careful investigation of its effect on a number of local cases. At first the alkaloid was unobtainable and the Chemical Division undertook extraction from dried twigs of *Ephedra vulgaris* supplied by local Chinese medicine shops, but later in the year the alkaloid could be purchased in Kuala Lumpur.

A brief summary from the case reports is given below :

*Case I.*—A male European, aged 31, had been gassed in 1916 and had recurrent attacks of "infective" asthma every three weeks. Twenty minutes after administration of gr. i of the hydrochloride, the spasm was relieved, with disappearance of rales and rhonchi, but although blood pressure was unaffected, there was complaint of mental confusion which lasted for several hours. Subsequent attacks were arrested without the appearance of this unpleasant sequel, and they can now be successfully aborted in the incipient stage.

*Case II.*—A male European, aged 46, had had "allergic" asthma for the past twenty-two years. He was sensitive to milk, vinegar and white wine which sometimes produced asthma, sometimes urticaria. Attacks were cut short by the injection of adrenalin. Ephedrine hydrochloride gr. i was given with partial relief, but giant urticaria developed which, however, decreased in severity with subsequent doses (a similar reaction was caused by aspirin). Blood pressure was reduced about 10 mms. hg. by ephedrine during an attack, but, in the intervals, a rise of about 10 mm. followed administration.

*Case III.*—A male European, aged 46, had had "infective" asthma associated with bronchitis and emphysema for nine years. Attacks were relieved by the injection of adrenalin. Ephedrine hydrochloride gr. i was followed by very slight relief but, some hours later, palpitation, tremors and a tendency to collapse developed; these unpleasant symptoms lasted about twelve hours.

*Case IV.*—A male Sikh, aged 27, had had frequent attacks of "reflex" asthma in the early mornings for the previous twelve months. The middle turbinates were swollen and oedematous. The hydrochloride grs.  $1\frac{1}{2}$  was given with very successful results and blood pressure fell from S. 138/D. 96 to S. 128/D. 85. In a quiescent period a similar dose was followed by a rise from S. 125/D. 90 to S. 142/D. 92 in three hours, and three hours later the pressure had again fallen to normal.

*Case V.*—A male Chinese, aged 31, had had "infective" asthma, which was relieved by adrenalin, for a period of five years. An attack was cut short within half an hour of the administration of grs.  $1\frac{1}{2}$  of the hydrochloride. The patient was advised to take an infusion of *Ephedra* twice daily, which has successfully warded off further attacks. No toxic symptoms have been observed, with the possible exception of occasional excessive sweating.

*Case VI.*—A male Chinese, aged 48, had had "infective" asthma for four years. Attacks were successfully treated with adrenalin, and complete relief followed half an hour after the exhibition of grs.  $1\frac{1}{2}$  of ephedrine hydrochloride. Infusion of *Ephedra* is now taken twice daily as a prophylactic with success.

*Case VII.*—A female Eurasian, aged 11, had had "reflex" asthma for six weeks. The hydrochloride, gr.  $\frac{1}{2}$ , relieved the attacks, without alteration in the blood pressure.

*Case VIII.*—A female Eurasian, aged 9 (a sister of case VII and with similar clinical findings), had had attacks of asthma. The hydrochloride, gr.  $\frac{1}{2}$ , relieved attacks, without alteration in the blood pressure. In an interval the pressure was increased from S. 108/D. 80 to S. 124/D. 90 within forty minutes after a similar dose.



*Case IX.*—A male Sinhalese, aged 56, had a history of “infective” asthma for ten years and was given grs.  $1\frac{1}{2}$  of the hydrochloride, with partial relief. There was no alteration in blood pressure, although, in the quiescent period, this dose caused a rise of from S. 114/D. 82 to S. 134/D. 94 in two hours. Four hours later the pressure had fallen to normal.

*Case X.*—A female Sinhalese, aged 28, had had “infective” asthma associated with bronchitis and emphysema for ten years. The hydrochloride (grs.  $1\frac{1}{2}$ ) was given with slight relief within thirty minutes, but ten minutes later the patient developed tremor, sweating, tachycardia, and partial collapse. In subsequent attacks a reduced dosage brought some relief, but there was persistence of minor toxic symptoms. During a spasm the blood pressure was practically unaltered by ephedrine, but between attacks an increase from S. 125 to S. 135 was produced in an hour.

Complete relief during attacks was thus obtained in six of ten cases, but no less than half the patients developed toxic symptoms. During an attack the blood pressure may fall slightly or remain stationary after the exhibition of ephedrine, but, in the intervals, the drug causes a definite rise which persists for about five hours.

In cases of hay fever the direct application, or spraying, of a three per cent. solution of the sulphate to the swollen turbinates was followed by almost immediate temporary relief. Oral administration, however, was without effect.

#### VARIOLA MINOR.

Towards the end of the year an outbreak of Variola occurred in Selangor in which cases exhibited many features that characterise descriptions of alastrim. About one hundred cases were reported and, thanks to the courtesy of Drs. A. K. Cosgrave, W. O. Pou and W. J. Vickers, we were enabled in several instances to observe the course of the disease.

The initial stage was marked by malaise, but, though nausea was frequently noted, patients rarely complained of vomiting or of the characteristic lumbar pain. In the majority of the cases symptoms preceded the appearance of the rash by about twenty-four hours, but the duration of this stage varied from a few hours to three days.

The rash itself commenced on the face or chest and passed through the customary stages, but the usual interval between stages was often considerably shortened, and many lesions aborted as papules or vesicles. Rarely, the rash tended to be somewhat pleomorphic. In many cases the lesions seemed to be situated rather superficially in the skin but were generally surrounded by a wide ring of erythema. Vesicles were usually umbilicated and mere pricking was insufficient to evacuate the contents. Tongue and soft palate were occasionally involved. On healing, slight scarring occurred and local loss of pigment was well seen on the brown skin of the Malay or on the black skin of the Tamil.

All the cases were of a mild nature and the mortality was nil. The distribution of the rash was unusual for smallpox, and it is probable that comparative absence of clothes with consequent exposure of the surface of the body to the sun modifies the value of this feature in differential diagnosis.

TABLE VI.  
DISTRIBUTION OF SMALLPOX LESIONS.

Nationality.	Age.	Total lesions.	No. of lesions on part expressed as a percentage of total.							
			Face.	Trunk.	Arms.	Fore-arms.	Hands.	Thighs.	Legs.	Feet.
Malay ...	12	284	18	35	7	8	3	19	7	3
„ ...	15	199	21	39	7	7	3	9	11	3
„ ...	11	466	11	43	7	7	2	24	6	0
„ ...	33	123	21	56	8	6	2	6	1	0
„ ...	1	76	39	23	14	12	0	10	1	1
„ ...	18	860	13	27	7	8	4	19	19	3
„ ...	6	214	31	37	10	5	5	8	3	1
Tamil ...	23	45	15	30	9	13	11	13	9	0
„ ...	24	256	10	50	14	4	1	15	6	0



Fluid was obtained from vesicles and pustules in nine cases by means of multiple punctures with capillary pipettes. Specimens from these cases were employed for the performance of Paul's test by inoculation of the conjunctivae of rabbits. In only two instances did characteristic minute pearly papules develop, and these had faded by the fourth day. All other specimens gave negative results, though the rabbits employed were found to be susceptible when control tests with diluted lymph were carried out.

Rabbits were also immunised with lymph and subjected to intradermal inoculation with the contents of the lesions. Very slight erythema only was noted around the injections on the following day, but inoculations with diluted lymph caused definite skin reactions.

It is suggested that the virus of "Variola Minor" may fail to cause the definite reactions of "Variola Major" in these so-called diagnostic tests.

#### THE LIVER EXTRACT TREATMENT OF ANAEMIA.

Grave secondary anaemia is not uncommon among the poorer class of hospital patients. It may accompany chronic malaria or massive ankylostomiasis, and is sometimes seen in debilitated women as a sequel to parturition. Possibly an ill-balanced diet is also of etiological significance. The condition frequently fails to respond to the usual therapeutic measures, and patients admitted to hospital with haemoglobin below twenty-five per cent. may be under treatment for long period.

In view of the favourable reports which have been published of the effect of liver extract on the blood picture of pernicious anaemia, it was decided to try this treatment on a number of secondary cases. An extract of bullock's liver, prepared by treating for two hours finelyminced liver with an equal weight of water, and filtering through gauze, was given twice daily, in quantities of four ounces. Up to the present time seven cases have been treated, of which brief notes are given below :

*Case I.*—An adult female, aged 23, had been treated with an iron and arsenic mixture for four weeks, during which time the haemoglobin remained stationary at 30 per cent. During the following four weeks on liver extract the haemoglobin increased steadily to 50 per cent., and erythrocytes from 2,100,000 to 3,200,000 per c.mm.

*Case II.*—An adult female, aged 25, had on admission to hospital 10 per cent. of haemoglobin. On liver extract, the percentage rose to 45, and the erythrocytes from 800,000 to 2,800,000 per c.mm. in four weeks.

*Case III.*—An adult female, aged 30, was treated with both iron and arsenic mixture and liver extract. In four and a half weeks the haemoglobin increased from 30 to 50 per cent.

*Case IV.*—An adult male, aged 30, was treated with liver extract for five weeks. The haemoglobin increased from 25 to 40 per cent.

*Case V.*—An adult male, aged 43, was given iron and arsenic for a period of two weeks, but the haemoglobin remained stationary at 30 per cent. After two and a half weeks on liver extract haemoglobin had increased to 50 per cent. and the red count from 2,400,000 to 3,700,000 per c.mm.

*Case VI.*—An adult male, aged 38, was treated for three weeks with a preparation of haemoglotin, but without improvement. In the following three weeks, on liver extract haemoglobin rose from 30 to 40 per cent. and the erythrocytes from 1,400,000 to 2,600,000 per c.mm.

*Case VII.*—An adult female, aged 28, was given liver extract. Three weeks later haemoglobin had increased from 20 to 35 per cent. and the erythrocytes from 1,800,000 to 2,800,000 per c.mm.

*Control.*—An adult female, aged 30, was treated with iron and arsenic only. Haemoglobin increased from 20 to 30 per cent. and the erythrocytes from 1,700,000 to 2,200,000 per c.mm. in three weeks.

At this early stage, it is only possible to conclude that liver extract does not effect magic improvement in cases of grave secondary anaemia. It does, however, bring about an amelioration of the condition both haemoglobin and erythrocytes steadily increase under the treatment and the results are definitely better than those obtained with iron and arsenic.



THE VIABILITY OF *B. TYPHOSUS* AND *V. CHOLERAE* IN KUALA LUMPUR WATERS.

The viability of intestinal pathogens in river water is of local importance because many indigenes are accustomed to deposit their excrement directly into rivers, which are frequently the sole source of domestic supply for villages along the banks. The question has acquired added interest on account of the recent introduction of numerous small septic tanks in town residential districts. Effluents from these installations leave much to be desired, and are discharged into open drains, which lead directly to a river.

An investigation of the life of *B. typhosus* and *V. cholerae* in river water has therefore been undertaken. Samples were obtained from the three streams (I, II and III) entering Kuala Lumpur and from the outgoing river (IV). Dr. F. E. Byron carried out a chemical analysis of the specimens, and his results are embodied in the following table.

TABLE VII.  
PARTS PER 100,000 (UNLESS OTHERWISE STATED).

Specimens.	Reaction.	Ammoniacal nitrogen.	Albuminoid nitrogen.	Oxygen absorbed (permanganate 3 hours).	Chlorine.	Total solids.	Nitrites.	Suspended solids.
I. Batu River... ..	7.0	.0036	.0200	.6990	.18	74.95	Nil	68.45
II. Gombak River ... ..	7.0	.0012	.0080	.1367	.16	5.85	"	0.85
III. Klang River (incoming) ...	7.0	.0024	.0560	2.842	.28	237.30	"	227.65
IV. Klang River (outgoing) ...	7.0	.0150	.0320	.9168	.30	110.25	"	98.75

The experiment was conducted in flasks kept in diffused day-light and at room temperature. Two hundred and fifty c.cms. of river water were placed in each flask and heavy infecting doses of 1,000 millions of *B. typhosus* or 3,000 millions of *V. cholerae* were employed. Sub-cultures were made every twelve hours. *B. typhosus* was recovered for three days from specimens I and III, and for four days from specimens II and IV. *V. cholerae* was obtained for two days from specimen IV and for three days from specimens I, II and III. It is of interest that *Leptospira* was cultured from specimens II and IV. In water from the Kuala Lumpur pipe supply both *B. typhosus* and *V. cholerae* were viable for three days.

It is not claimed that natural river conditions were closely simulated in this experiment, but the results probably indicate that pollution of rivers is a serious menace to the public health.

A FATAL CASE OF *B. VIOLACEOUS* INFECTION.

An autopsy was performed on an elderly Chinese, who for three weeks before death was very ill with high remittent fever and delirium. The liver was enlarged, containing several abscesses, and one was also present in the spleen. The case was at first thought to be one of melioidosis; pus from the abscess was creamy in nature, and a bacillus showing some polar staining with Leishman's stain was seen in smears.

Cultures were made from both organs and within twenty-four hours a violet growth occurred in all the tubes. Colonies were two to three mms. in diameter and had a metallic sheen; they resembled those of *B. violaceous* which is often seen in cultures from tap water.

A guinea-pig was inoculated subcutaneously with a small quantity (0.4 c.cms.) of an emulsion of bacilli and an abscess formed from which the organism was recovered. Healing occurred in three weeks. The animal was sacrificed at a later date and a few pigmented areas in both lungs, slight enlargement of the spleen, and three enlarged mesenteric glands were found. Cultures from heart-blood, spleen, gall-bladder and glands remained sterile.

A strain of *B. violaceous* was isolated by Mr. J. E. Lesslar from one of the Kuala Lumpur service reservoirs. Two guinea-pigs were inoculated subcutaneously with 0.5 c.cms. of peptone water cultures, the first with the post-mortem strain and the second with the water strain. The former died within forty-eight hours with wide-spread subcutaneous oedema from which the infecting bacillus was recovered, but the



latter was unaffected. Two rabbits inoculated one with each strain remained healthy, and cross agglutination tests showed that the serum of each animal agglutinated both strains to a high titre. The fermentation reactions of the strains were identical and are given below :

Lactose, 0; Saccharose, acid (third day); Glucose, acid; Mannite, 0; Dulcitol, 0; Dextrin, 0; Maltose, acid; Laevulose, acid; Gallactose, 0; Inulin, 0; Salicin, 0; and Xylose, 0.

Acidity was produced in litmus milk; Loeffler's serum medium and gelatine were liquified, the strains grew well on potato; they were haemolytic, motile, and non-indologenic.

#### ENCEPHALITIS LETHARGICA.

Sporadic cases of this disease have been noted in Malaya for some years. They have been few in number and scattered in distribution. Usually the disease is seen in the acute delirious form, but occasional cases present symptoms of prolonged somnolence. Post-encephalitic Parkinsonism has been observed by Dr. D. M. McSwan. During the year a fatal case was treated in the District Hospital, Kuala Lumpur (Dr. J. P. Fitzpatrick), and the histological findings were consistent with the diagnosis.

#### MELIOIDOSIS.

Four cases of melioidosis came under observation, three of Tamil, and one of Chinese, nationality. At the autopsies the usual picture of disseminated abscesses in liver, spleen, kidneys, and lungs was seen.

Dr. Fletcher continued his investigations of the biological characteristics of *B. whitmori*. It was found that cultures showed no sign of growth under the anaerobic conditions which obtain in the Fildes and McIntosh jar, though luxuriant growth occurred when tubes were removed from the jar to an incubator. The bacillus was found to survive for some weeks in pond water, to be very resistant to desiccation, but sensitive to heat.

#### LEPROSY.

Experiments have been undertaken with a view to elucidation of the mode of infection in leprosy. Monkeys (*Macacus cynomologus*) are being employed as experimental animals, and material for the attempted infections was obtained from nasal washings of acute leprosy cases and from an emulsion prepared from an excised nodule by grinding with sand.

Three routes of infection have been employed :

- (a) Inoculation—bacilli were injected subcutaneously into the palm.
- (b) Inhalation—the emulsion was sprayed into the nasal cavity.
- (c) Ingestion—a quantity of the emulsion was passed into the stomach by means of a stomach tube.

The experiment has been in progress for only a few weeks and there is as yet no clinical indication of infection.

#### CHOLERA.

Dr. F. d'Herelle has kindly supplied us with a quantity of specific bacteriophage for clinical trial, and, by the courtesy of Dr. R. Gautier of the Eastern Bureau, League of Nations, Health Organisation, we have received a quantity of anti-toxic serum, prepared by methods recently elaborated by Dr. Hahn. Since the receipt of these products there has been no cholera at the Quarantine Camp and hence no opportunity for a controlled trial.

#### LEISHMANIASIS.

Although there are a large number of immigrants to this country from India and China, leishmaniasis is very rarely seen and there is no record of the occurrence of endemic infections. During the year a case of oriental sore was sent by Dr. V. D. Wyborn to the laboratory for diagnosis. The lesion was typical in appearance, some three-quarters of an inch in diameter, and raised about an eighth of an inch above the surrounding skin. It was situated on the mid-line of the forehead and about half an inch above the eyebrows. The patient was a police recruit from India and volunteered the information that a small papule had been present when he left India some five months before.

Material, obtained with fine pipettes from the edge of the sore, contained large numbers of *Leishmania* and cultures on N.N.N. medium yielded numerous flagellates.



## MEASLES.

A number of monkeys (*Macacus cynomologus*) were obtained for an investigation of the etiology of measles, but, during the year, very few cases came under observation, and those were unusually mild in type. In three instances blood was obtained by venepuncture within forty-eight hours of the appearance of the rash, and monkeys and Belgian hares were inoculated by the subcutaneous route. Gauged by temperature charts and clinical observations, none of these inoculations was successful in transmitting infection.

## BRONCHO-PULMONARY FUSO-SPIROCHAETOSIS.

An investigation into the nature and incidence of this infection has resulted in observations of some interest. Typical fusiform bacilli and spirochaetes are frequently present in the mouths of local Asiatics, particularly in the cooly class of Chinese amongst whom dental sepsis is common. Over a large series of cases the causal organisms of Vincent's angina have never been seen unaccompanied by *Staphylococci*, *Streptococci*, *Pneumococci* or other bacteria. It appears probable that the fusiform bacilli and spirochaetes tend to invade the tissues after local defences have been broken down by antecedent inflammation.

Spirochaetal gangrene of the lung was noted in no less than twenty of one hundred and one post-mortem examinations on cases dead of pneumonia. Oral hygiene during the course of the disease should be a measure of prophylactic value.

A constant finding in broncho-pulmonary infections has been the presence of small white cheesy flakes in the sputum, not unlike the granules in pus from actinomycotic lesions. These seem to be almost pathognomonic of the condition.

## AN UNUSUAL FORM OF ULCERATION OF THE SMALL INTESTINE.

Attention has recently been directed by Drs. Scott and Cleland to an unusual form of ulceration of the small intestine that they have observed in Australia. During the past four years three instances of a similar condition have been seen in 3,000 autopsies in Kuala Lumpur. The cases were of Tamil nationality and a brief description of the two cases observed in the past year is given below :

- (1) A young emaciated Tamil had complained of passing five to seven loose motions daily, without blood or mucus, for about a month. At the autopsy nine small superficial ulcers were present in the upper part of the jejunum. Some were circular in outline, but the majority were oval, with the longer diameter transverse to the axis of the bowel. There was slight puckering of the peritoneal surface of the ulcers. The remainder of the alimentary canal was normal, and no lesion was seen elsewhere in the body.
- (2) A Tamil, aged 30, was admitted to hospital with urethritis, progressive emaciation, and diarrhoea. The Wassermann reaction was negative and intestinal tuberculosis was suspected. Post-mortem examination showed a series of transverse ulcers extending from the lower third of the duodenum to within two feet of the ilio-caecal valve. Four to five ulcers occurred in each foot of small intestine; they were superficial and some encircled the lumen of the bowel. The base of these ulcers was smooth, with slightly raised edges, and the peritoneal surface showed some puckering. No tubercles were seen nor was there evidence of tubercular infection in any part of the body. A tendency to healing with scarring was noted.

Films from the ulcers of both cases contained no acid-fast organisms nor protozoa. Cultures yielded coliform bacilli only. In sections there was no evidence of tubercular infection, the picture being one of chronic inflammatory change. This type of ulceration appears to have no special predilection for lymphoid tissue.

## AINHUM.

This disease is so infrequently seen in Malaya that a short note on a case, which has been under the care of Dr. C. S. Wilson, is included. The subject was a male Tamil; aged 30 years, who had come to Malaya from Madura fifteen years before, and had worked on rubber plantations at Kajang, Gombak and Batu Tiga. He stated that none of his friends in India or in Malaya had a similar affection. There was no history of venereal disease, but ten years previously he had had for some months a burning sensation of the soles.



Two years before, a cleft had appeared on the inner aspect of the digito-plantar fold which gradually extended to encircle the right little toe. When admitted to hospital the constricting band was about one-eighth of an inch wide and radiographic examination (Dr. C. F. Constant) showed absorption of bone distal to the constriction.

The process was less advanced on the left side where it had commenced only one year previously.

#### BLACK TONGUE.

A case of "Black Tongue", an infection rarely seen in Malaya, came under observation through the courtesy of Dr. G. A. Dunlop. The patient was a European who complained of "indigestion" and stated that he had previously had a similar condition of the tongue, which had lasted for three or four months. The posterior two-thirds of the organ showed hypertrophied papillae and presented a carpet of brown-black fur, which could be easily detached, leaving a smooth non-bleeding surface.

On microscopical examination the epithelial cells were seen to be infiltrated by a yeast-like organism that grew well at room temperature on glucose agar or Sabouraud's medium, and in due course elaborated a brownish pigment. Reproduction was by budding; no mycelial elements or asco-spores were seen. The organism formed acid and gas in glucose and laevulose, and its characteristics appeared to correspond with those of *Cryptococcus lingue-pilosae* (Lucet).

Local treatment with one in five dilutions of Lugol's iodine solution and the internal use of an alkaline gentian mixture caused a rapid disappearance of the pigmented fur.

#### INTESTINAL MYIASIS.

Certain larvae which had been noticed in the faeces of a Chinaman were submitted for identification. They were found to be the rat-tailed larvae of *Eristalis*.

#### PASTEUR TREATMENT.

In August, 1924, a Division of the Institute for Medical Research was opened for the prophylactic treatment of rabies. Prior to that date persons in Malaya who had been bitten by, or had been in dangerous contact with, rabid dogs had proceeded to India, Siam or Java for treatment.

Since the opening of the Division, two hundred and fifty-nine cases have received a complete course of treatment and forty-six an incomplete course. Cartolised vaccine consisting of 1 per cent. nerve tissue in 0.5 per cent. carbol-saline is used in the treatment of human cases, the full course consisting of fourteen daily injections of 5 c.cms. A prophylactic vaccine, which consists of twenty parts of nerve tissue, forty parts of glycerine, and thirty parts of 1.25 per cent. phenol in salt solution, is prepared for dogs. The recommended dose is 6 c.cms. in a single injection. Two strains of fixed virus are employed in the preparation of the vaccine, a fresh passage and a new batch of vaccine being made every month. The "C" strain was obtained from the Pasteur Institute, Coonoor (originally from the Pasteur Institute, Paris) and the "L" strain from Colombo.

During March, 1927, Dr. R. Green, who has been in charge of anti-rabies vaccination during the year, while on a visit to Indo-China received by the courtesy of Dr. Souchard of the Pasteur Institute, Saigon, two fresh strains of fixed virus. One of these was a strain originally from the Pasteur Institute, Paris, fixed some thirty years ago, and is used for prophylactic purposes in Indo-China. The second was a local strain, obtained from a case of "street" rabies in Saigon. Fixation had occurred in its twenty-second passage and, when received from M. Souchard, the virus was in its thirty-fourth passage. Subsequently at this Institute, seventeen further passages have been made, without apparent alteration in its properties. It is probable that this Saigon strain is representative of the indigenous virus occurring in Indo-China, Siam and Malaya, and, after a further series of passages, it is proposed to use it in the preparation of anti-rabic vaccine.

#### TREATMENT OF PATIENTS.

During 1927, the number of patients applying for treatment was one hundred and twenty-three. Of these, sixty-two received a full course of prophylactic anti-rabic injections, eight did not complete the course, and fifty-three received advice only.

Of the seventy cases commencing treatment, twenty-one had been bitten by animals proved rabid by laboratory examination, three had been bitten by animals certified rabid by a medical or veterinary officer, four had been bitten by animals having a history highly suggestive of rabies, thirty-four had recent abrasions contaminated by the saliva of proved rabid animals, and six had had similar contamination of recent abrasions by the saliva of animals thought to be rabid, but which were untraceable.



No deaths from rabies have occurred among the nineteen Europeans, five Eurasians, three Malays, ten Chinese and thirty-three Indians who underwent treatment.

Table VIII shows the cases applying for treatment at Kuala Lumpur, grouped in accordance with domicile and nationality, and Table IX gives an indication of the degree of risk.

TABLE VIII.  
PASTEUR TREATMENT CASES FOR THE YEAR 1927.

1927.	Nationality.	Selangor.	Perak.	Negri Sembilan.	Singapore.	Penang.	Malacca.	Kedah.	Province Wellesley.	Pahang.	Kelantan.	Total.
Complete course of treatment	Europeans ...	...	...	13	1	..	...	...	3	...	1	18
	Eurasians ...	...	...	5	...	...	...	...	...	...	...	5
	Malays...	...	...	...	...	...	1	...	2	...	...	3
	Chinese ...	2	...	1	...	2	...	1	1	...	...	7
	Indians...	1	2	11	...	1	...	2	11	1	...	29
	Total ...	3	2	30	1	3	1	3	17	1	1	62
Incomplete course of treatment	Europeans ...	...	...	...	...	...	...	...	1	...	...	1
	Eurasians ...	...	...	...	...	...	...	...	...	...	...	...
	Malays...	...	...	...	...	...	...	...	...	...	...	...
	Chinese ...	1	...	2	...	...	...	...	...	...	...	3
	Indians...	3	1	...	...	...	...	...	...	...	...	4
	Total ...	4	1	2	...	...	...	...	1	...	...	8
Advice only	Europeans ...	4	...	...	...	...	...	...	...	...	...	4
	Eurasians ...	2	...	...	...	...	...	...	...	...	...	2
	Malays ...	2	...	...	...	...	...	...	...	...	...	2
	Chinese ...	19	...	...	...	...	...	...	...	...	...	19
	Indians ...	26	...	...	...	...	...	...	...	...	...	26
	Total ...	53	...	...	...	...	...	...	...	...	...	53

TABLE IX.  
AN ANALYSIS OF THE DEGREE OF RISK.

Position of bite.		(i).	(ii).	(iii).	(iv).	(v).	(vi).	Total.
Face	...	...	...	...	...	2	...	2
Limbs and trunks unclothed	...	16	1	4	31	5	1	58
Limbs and trunks through clothing	...	5	2	...	3	...	...	10
Total		21	3	4	34	7	1	70

- (i) Cases bitten by animals proved rabid by laboratory examination.  
(ii) Cases bitten by animals certified rabid by Medical or Veterinary Officer. No laboratory tests.  
(iii) Cases bitten by animals almost certainly rabid according to history. No laboratory tests.  
(iv) Cases with recent abrasions contaminated with the saliva of proved rabid animals.  
(v) Cases bitten by animals which were untraceable.  
(vi) Cases having abrasions contaminated with the saliva in which laboratory tests were negative.

#### PROPHYLAXIS OF RABIES IN KEDAH.

A number of canine cases occurred in Kedah during the year with consequent risk to human contacts, and for convenience and to minimise delay in commencing the course, a treatment centre has been opened there. The Medical Officer, Alor Star, attended the Institute for Medical Research for instruction in Pasteur treatment and subsequently anti-rabic vaccine was forwarded to Kedah for local use. Ten cases have received a complete course of treatment and two an incomplete course.

Table X shows the number and nationality of patients treated in Kedah and Table XI the degree of risk.

TABLE X.  
CASES TREATED IN KEDAH, 1927.

Complete course of treatment.							Number of cases treated.		Total.
European	...	...	...	...	...	...	3	...	—
Eurasian	...	...	...	...	...	...	—	...	—
Malay	...	...	...	...	...	...	—	...	—
Chinese	...	...	...	...	...	...	2	...	—
Indian	...	...	...	...	...	...	5	...	10
Incomplete course of treatment.							Number of cases treated.		Total.
European	...	...	...	...	...	...	1	...	—
Eurasian	...	...	...	...	...	...	—	...	—
Malay	...	...	...	...	...	...	—	...	—
Chinese	...	...	...	...	...	...	—	...	—
Indian	...	...	...	...	...	...	1	...	2

TABLE XI.  
SHOWING RESULTS OF TREATMENT IN KEDAH CASES.

Position of bite.					(i).	(ii).	(iii).	(iv).	(v).	Total.	Deaths.	
Face	...	...	...	...	...	—	...	—	...	—	...	—
Limbs and trunk	unclothed				...	1	...	6	...	—	...	2
Limbs and trunk	clothed				...	—	...	1	...	—	...	—
					—	—	—	—	—	—	—	—
Total					...	1	...	7	...	—	...	2
					...	1	...	7	...	2	...	12

- (i) Cases bitten by dogs proved rabid by laboratory examination.
- (ii) Cases bitten by dogs almost certainly rabid according to history. No laboratory tests.
- (iii) Cases with recent abrasions contaminated with the saliva of dogs proved rabid by laboratory examination.
- (iv) Cases which underwent treatment on suspicion but treatment ceased when the animal was considered not rabid.
- (v) Cases bitten by animals which were untraceable.

## TREATMENT CENTRE IN PENANG.

Later in the year a treatment centre was opened at Penang. Vaccine was sent from the Institute as required and administered by the Government Pathologist, Dr. J. A. Cowan. A complete course of anti-rabic treatment was given to two Europeans, one Chinese and one Malay.

## OCCURRENCE OF RABIES IN ANIMALS.

Seventy-eight dogs' brains, four cows' brains and one buffalo's brain were submitted for microscopic diagnosis of rabies. Twenty-nine of the dogs' brains and three cows' brains shewed the changes characteristic of the disease, a similar positive diagnosis being made in the case of the buffalo which was said to have been bitten by a ratid dog.

Table XII shows the results of examination of animals' brains submitted for diagnosis, and the areas from which they were sent.

TABLE XII.

[illegible]

Three cows' brains from Negri Sembilan (two positive), one from Perak (positive) and one buffalo's brain from Kedah (positive) are included in the above table.



## PROPHYLACTIC INOCULATION OF DOGS.

Canine vaccine is issued to the State Veterinary Surgeons as required, and three hundred and twenty-two doses were used during the year.

Negri Sembilan	...	...	...	...	...	...	...	240
Perak	...	...	...	...	...	...	...	1
Singapore	...	...	...	...	...	...	...	1
Kedah	...	...	...	...	...	...	...	30
Province Wellesley	...	...	...	...	...	...	...	50
								<hr/> 322

Two of these three hundred and twenty-two canine inoculations are reported to have failed to protect. In the first instance the dog died of rabies three weeks after inoculation, and the animal was almost certainly infected with rabies prior to vaccination. The second animal is stated to have died of rabies six months after inoculation with 5 c.cms. of anti-rabic vaccine. The owner, however, stated that the injection of the full dose was prevented by the struggles of the animal.

We have to acknowledge the cordial co-operation of Government Veterinary Surgeons which has greatly facilitated the working of the Institute.

## ROUTINE EXAMINATIONS.

## VENEREAL DISEASES.—

EREA L DISEASES.—								1926.	1927.
<i>Wassermann Reactions—</i>									
Positive	...	...	... <sub>o</sub>	...	...	...	1,717	...	2,814
Negative	...	...	...	...	...	... <sub>t</sub>	4,404	...	6,195
Anticomplimentary			... <sub>o</sub>	...	...	...	—	... <sub>t</sub>	482
<i>Treponema pallidum—</i>									
Positive	... <sub>o</sub>	...	...	...	...	...	3	...	7
Negative	...	... <sub>i</sub>	...	...	...	...	10	...	14
<i>Gonococci—</i>									
Positive	...	...	... <sub>o</sub>	...	...	...	1	...	2
Negative	...	... <sub>i</sub>	...	...	...	...	12	...	8

## ENTERIC FEVERS.—

### Widal Reactions—

Positive for <i>B. typhosus</i>	...	...	...	197	...	224
„ „ <i>B. paratyphosus</i> A.	...	...	...	4	...	4
„ „ <i>B. paratyphosus</i> B.	...	...	...	4	...	3
„ „ <i>B. paratyphosus</i> C.	...	...	...	0	...	1
Negative	...	...	...	1,033	...	1,135

### BACTERIOLOGICAL EXAMINATION OF FAECES.—

Positive for <i>B. typhosus</i>	...	...	...	...	49	...	36
„ „ <i>B. paratyphosus</i> A.	...	...	...	...	2	...	0
„ „ <i>B. paratyphosus</i> B.	...	...	...	...	1	...	0
„ „ <i>B. paratyphosus</i> C.	...	...	...	...	0	...	1
Negative	...	...	...	...	830	...	582

### BACTERIOLOGICAL EXAMINATION OF URINE.—

Positive for <i>B. typhosus</i>	...	...	...	...	11	...	15
„ „ <i>B. paratyphosus</i> A.	...	...	...	...	1	...	0
„ „ <i>B. paratyphosus</i> B.	...	...	...	...	0	...	1
„ „ <i>B. paratyphosus</i> C.	...	...	...	...	0	...	1
Negative	...	...	...	...	308	...	342

CYSTITIS.—

### Bacteriological Examination of Urine—

Positive for <i>B. coli</i>	...	...	...	...	—	...	27
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### AMOEBIASIS.—

*Faeces*—

Positive for <i>E. histolytica</i>	...	...	...	15	...	19
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### TROPICAL TYPHUS.—

### Weil-Felix Reactions—

Positive	...	...	...	...	...	183	...	259
Negative	...	...	...	...	...	1,076	...	1,668

### BACILLARY DYSENTERY.—

### Bacteriological Examination of Faeces—

Positive for <i>B. dysenteriae</i> (Flexner) ...	...	250	...	53
„ „ <i>B. dysenteriae</i> (Shiga) ...	...	3	...	1

MENINGITIS.—							1926.	1927.
<i>Cerebro-Spinal Fluid—</i>								
Positive for <i>Meningococci</i>	...	...	...	...	...	...	20	26
„ „ <i>Pneumococci</i>	...	...	...	...	...	...	17	12
„ „ <i>B. influenzae</i>	...	...	...	...	...	...	2	0
„ „ <i>B. tuberculosis</i>	...	...	...	...	...	...	2	1
Negative	...	...	...	...	...	...	21	46
CHOLERA.—								
Positive	...	...	...	...	...	...	156	81
Negative	...	...	...	...	...	...	536	524
PLAGUE (HUMAN).—								
Positive	...	...	...	...	...	...	—	25
Negative	...	...	...	...	...	...	2	9
DIPHTHERIA.—								
Positive	...	...	...	...	...	...	99	92
Negative	...	...	...	...	...	...	401	552
LEPROSY.—								
Positive	...	...	...	...	...	...	41	29
Negative	...	...	...	...	...	...	61	93
LEPTOSPIROSIS.—								
<i>Cultures—</i>								
Positive	...	...	...	...	...	...	7	22
Negative	...	...	...	...	...	...	16	5
<i>Urine—</i>								
Positive	...	...	...	...	...	...	4	3
Negative	...	...	...	...	...	...	21	23
AUTOGENOUS VACCINES	...	...	...	...	...	...	74	82
BLOOD-SUGAR ESTIMATIONS	...	...	...	...	...	...	170	18
RATS EXAMINED	...	...	...	...	...	...	29	60
MISCELLANEOUS TESTS	...	...	...	...	...	...	7,048	8,057

## MORBID HISTOLOGY.

Sections of 252 specimens from various hospitals were cut and examined. Details of benign and malignant tumours are given in the following tables XIII and XIV.

TABLE XIII.  
BENIGN TUMOURS.

Case No.	Nationality.	Serial No.	Sex.	Age.	Site of tumour.	Nature of tumour.
1	Chinese	18	F.	50	Breast	Lipoma
2	„	30	M.	29	Buttock	Sebaceous cyst
3	„	39	F.	30	Vulva	Condyloma
4	„	55	M.	51	Zygomatic fossa	Dermoid cyst
5	„	135	M.	48	Rectum	Adenoma
6	„	136	M.	40	Palm of hand	Fibroma
7	„	199	M.	4	Muscle	Haem-angioma
8	„	223	F.	56	Auditory meatus	Papilloma
9	„	226	M.	64	Nose	Polypus
10	„	238	M.	43	Ovary	Papillary cyst-adenoma
11	Tamil	32	F.	45	Nose	Fibrous polypus
12	„	62	F.	3	Eyelid	Dermoid cyst
13	„	104	F.	17	Breast	Fibro-adenoma
14	„	105	M.	7	Face	Haemangioma
15	„	178	F.	34	Gums	Fibrous epulis
16	„	222	F.	65	Labium	Fibro-lipoma
17	Malay	132	F.	30	Gums	Fibrous-polypus
18	„	137	F.	15	Scalp	Lymph-angioma
19	„	200	M.	40	Thigh	Fibro-chondroma
20	Javanese	189	F.	20	Ear	Fibroma
21	Sikh	17	M.	39	Anus	Condyloma
22	„	87	M.	37	Back	Dermoid cyst
23	European	5	F.	43	Breast	Fibro-adenoma
24	„	65	M.	28	Back	Papilloma
25	„	198	F.	30	Breast	Fibro-adenoma
26	„	219	F.	31	„	„



TABLE XIV.  
MALIGNANT TUMOURS.

Case No.	Nationality.	Serial No.	Sex.	Age.	Site of tumour.	Nature of tumour.
1	Chinese ...	3	M.	65	Skin ...	Epithelioma
2	" ...	4	M.	28	Penis ...	"
3	" ...	5	M.	42	Liver ...	Primary adeno-carcinoma
4	" ...	8	M.	—	" ...	"
5	" ...	9	M.	55	Brain ...	Endothelioma
6	" ...	10	M.	37	Gums ...	Epithelioma
7	" ...	13	M.	25	Sole of foot ...	Fibro-sarcoma
8	" ...	14	M.	57	Neck ...	Epithelioma
9	" ...	19	M.	44	Glands ...	Lymph-adenoma
10	" ...	20	M.	46	Liver ...	Secondary carcinoma
11	" ...	22	M.	51	Neck ...	Endothelioma
12	" ...	24	M.	56	Gluteal region ...	Fibro-sarcoma
13	" ...	28	M.	52	Abdominal wall ...	Spindle-celled sarcoma
14	" ...	34	M.	27	Nasopharynx...	Epithelioma
15	" ...	35	F.	36	Cervix ...	Squamous-celled carcinoma
16	" ...	36	M.	45	Gland... ..	Lymph-adenoma
17	" ...	37	M.	52	Abdominal wall ...	Spindle-celled sarcoma
18	" ...	38	F.	36	Vulva ...	Epithelioma
19	" ...	54	M.	36	Rt. iliac fossa ...	Spindle-celled sarcoma
20	" ...	56	M.	21	Upper alveolar margin	Malignant Epulis
21	" ...	64	M.	36	Abdominal wall ...	Mixed-celled sarcoma
22	" ...	70	M.	50	Lung ...	Endothelioma
23	" ...	74	M.	29	Gluteal region ...	Mixed-celled sarcoma
24	" ...	75	M.	35	Penis ...	Epithelioma
25	" ...	81	M.	38	Liver ...	Primary adeno-carcinoma
26	" ...	83	M.	62	Neck ...	Round-celled sarcoma
27	" ...	84	M.	45	Penis ...	Epithelioma
28	" ...	85	M.	37	Neck ...	Endothelioma
29	" ...	86	M.	20	" ...	Round-celled sarcoma
30	" ...	90	M.	25	Sole of foot ...	Mixed-celled sarcoma
31	" ...	93	M.	59	Mediastinum...	Round-celled sarcoma
32	" ...	94	M.	52	Oesophagus ...	Scirrhus carcinoma
33	" ...	99	M.	50	Neck ...	Sarcoma
34	" ...	106	M.	55	" ...	Endothelioma
35	" ...	109	M.	65	Liver ...	Round-celled sarcoma
36	" ...	110	M.	42	Rectum ...	Adeno-carcinoma
37	" ...	111	M.	40	Brain ..	Glio-sarcoma
38	" ...	116	M.	55	Glands ...	Lymph-adenoma
39	" ...	119	M.	47	Abdominal wall ...	Fibro-sarcoma
40	" ...	120	M.	53	Temporo-malar fossa	Malignant dermoid
41	" ...	124	M.	49	Upper lid ...	Endothelioma
42	" ...	129	M.	—	Right groin ...	Lympho-sarcoma
43	" ...	140	M.	34	Meninges ...	Sarcoma
44	" ...	142	M.	48	Chest wall ...	Carcinoma
45	" ...	143	M.	25	Superior maxilla ...	Sarcoma
46	" ...	145	M.	54	Liver ...	Primary carcinoma
47	" ...	146	M.	40	Abdomen ...	Sarcoma
48	" ...	147	M.	32	Liver ...	Primary carcinoma
49	" ...	151	M.	30	" ...	Secondary carcinoma
50	" ...	158	M.	47	Cheek ...	Carcinoma
51	" ...	163	F.	43	Ovary...	Papillary cyst-adenoma
52	" ...	165	M.	50	Neck ...	Endothelioma
53	" ...	166	M.	78	Stomach ...	Adeno-carcinoma
54	" ...	171	M.	76	Neck ...	Endothelioma
55	" ...	172	M.	45	Liver ...	Primary adeno-carcinoma
56	" ...	175	M.	37	Penis ...	Epithelioma
57	" ...	177	M.	46	Angle of jaw...	Epithelioma
58	" ...	187	F.	54	Parotid gland ...	Endothelioma
59	" ...	191	M.	46	Pancreas ...	Adeno-carcinoma
60	" ...	191	M.	46	Liver ...	Secondary carcinoma
61	" ...	192	M.	24	" ...	Primary carcinoma
62	" ...	192	M.	24	Lungs ...	Secondary carcinomatous deposits
63	" ...	193	M.	32	Meninges ...	Endothelioma

TABLE XIV—(cont.).  
MALIGNANT TUMOURS—(cont.).

Case No.	Nationality.	Serial No.	Sex.	Age.	Site of tumour.	Nature of tumour.
64	Chinese ...	195	M.	48	Abdominal wall ...	Epithelioma
65	„ ...	201	M.	30	Cervical glands ...	Secondary carcinomatous deposits
66	„ ...	204	M.	63	„ ...	Sarcoma
67	„ ...	207	M.	42	Mediastinum ...	Round-celled sarcoma
68	„ ...	209	M.	29	Neck ...	Giant-celled sarcoma
69	„ ...	210	M.	63	Lower lip ...	Epithelioma
70	„ ...	214	M.	56	Liver ...	Primary carcinoma
71	„ ...	215	M.	30	Nasopharynx...	Carcinoma
72	„ ...	216	M.	51	Penis ...	Epithelioma
73	„ ...	218	M.	50	Neck ...	Sarcoma
74	„ ...	227	M.	45	Tongue ...	Epithelioma
75	„ ...	228	F.	10	Maxillary antrum ...	Mixed-celled sarcoma
76	„ ...	235	M.	45	Heart, lung, liver, kidney ...	Sarcomatous deposits
77	„ ...	240	M.	50	Penis ...	Epithelioma
78	„ ...	243	M.	45	Stomach ...	Carcinoma
79	„ ...	251	M.	50	Penis ...	Epithelioma
80	Tamil ...	1	M.	55	Tongue ...	„
81	„ ...	23	F.	40	Labium ...	„
82	„ ...	31	M.	40	Cheek... ...	„
83	„ ...	49	M.	38	„ ...	„
84	„ ...	51	M.	35	„ ...	„
85	„ ...	53	M.	35	„ ...	„
86	„ ...	59	F.	—	Cervical glands ...	Secondary carcinomatous deposits
87	„ ...	60	M.	35	Penis ...	Epithelioma
88	„ ...	63	M.	40	Foot ...	Spindle-celled sarcoma
89	„ ...	76	M.	35	Penis ...	Epithelioma
90	„ ...	91	M.	40	Stomach ...	Spheroidal-celled sarcoma
91	„ ...	95	M.	30	Cheek ...	Epithelioma
92	„ ...	96	M.	30	„ ...	„
93	„ ...	101	F.	29	Uterus ...	Hydatidiform mole
94	„ ...	125	M.	35	Meninges ...	Endothelioma
95	„ ...	126	M.	37	Cervix uteri ...	Adeno-carcinoma
96	„ ...	131	M.	32	Parotid gland ...	Endothelioma
97	„ ...	139	M.	42	Cheek... ...	Epithelioma
98	„ ...	141	M.	28	„ ...	„
99	„ ...	144	F.	23	Ovary ...	Sarcoma
100	„ ...	174	M.	20	Lip ...	Epithelioma
101	„ ...	179	M.	35	Cheek ...	„
102	„ ...	190	M.	25	Glands ...	Lymph-adenoma
103	„ ...	194	M.	25	Intestine ...	Adeno-carcinoma
104	„ ...	202	M.	35	Cheek... ...	Epithelioma
105	„ ...	205	M.	30	Parotid gland ...	Endothelioma
106	„ ...	237	M.	28	Leg ...	Fibro-sarcoma
107	„ ...	242	F.	28	Ovary... ...	Round-celled sarcoma
108	Japanese	7	F.	32	Palate ...	Myxo-sarcoma
109	Sikh ...	234	M.	52	Penis ...	Epithelioma
110	Malay ...	33	M.	34	Foot ...	Fibro-sarcoma
111	„ ...	72	F.	30	Breast ...	Epithelioma
112	„ ...	103	M.	63	Neck ...	Endothelioma
113	„ ...	122	M.	40	„ ...	„
114	„ ...	127	F.	27	Cervical gland ...	Lymph-adenoma
115	„ ...	159	M.	40	Ulcer, leg ...	Epithelioma
116	„ ...	186	M.	—	Humerus ...	Osteo-sarcoma
117	European	115	F.	40	Alveolar margin ...	Epithelioma
118	„ ...	138	F.	40	Breast ...	Adeno-carcinoma
119	„ ...	203	M.	50	Tongue ...	Epithelioma



## AUTOPSIES.

Post-mortem examinations were carried out by the Institute staff on all unclaimed bodies at the District Hospital, Kuala Lumpur. During the year, nine hundred and ninety-four examinations were performed and a table showing the causes of death is appended :

Disease.							No. of deaths.
Amoebiasis (Intestinal)	...	...	...	...	...	...	36
„ (Liver)	...	...	...	...	...	...	5
„ (Lungs)	...	...	...	...	...	...	2
„ (Mesentery)	...	...	...	...	...	...	1
Ankylostomiasis	...	...	...	...	...	...	1
Aneurysm of External Carotid	...	...	...	...	...	...	1
Anaemia (Secondary)	...	...	...	...	...	...	12
Beri-Beri	...	...	...	...	...	...	25
Cardio-vascular Affections	...	...	...	...	...	...	6
Cholecystitis	...	...	...	...	...	...	4
Cirrhosis of Liver	...	...	...	...	...	...	35
Cystitis	...	...	...	...	...	...	4
Dysentery (Bacillary)	...	...	...	...	...	...	197
„ (Mixed)	...	...	...	...	...	...	3
Encephalitis Lethargica	...	...	...	...	...	...	1
Enteritis of Children	...	...	...	...	...	...	2
Gastro-enteritis (acute)	...	...	...	...	...	...	4
Gastric Ulcer	...	...	...	...	...	...	2
Haemorrhage (cerebral)	...	...	...	...	...	...	2
Jaundice (arsenical)	...	...	...	...	...	...	1
„ (infectious)	...	...	...	...	...	...	1
Jejunal Ulcers	...	...	...	...	...	...	2
Malaria (acute)	...	...	...	...	...	...	115
„ (chronic)	...	...	...	...	...	...	47
Melioidosis	...	...	...	...	...	...	4
Meningitis (meningococcal)	...	...	...	...	...	...	4
„ (pneumococcal)	...	...	...	...	...	...	4
Nephritis (parenchymatous)	...	...	...	...	...	...	36
„ (intersitial)	...	...	...	...	...	...	21
Peritonitis	...	...	...	...	...	...	6
Pneumonia	...	...	...	...	...	...	91
Pulmonary gangrene	...	...	...	...	...	...	20
*Pyæmia	...	...	...	...	...	...	15
Respiratory Tract Affections	...	...	...	...	...	...	15
Senility	...	...	...	...	...	...	20
Sepsis	...	...	...	...	...	...	39
*Septicæmia	...	...	...	...	...	...	11
Spleen (ruptured)	...	...	...	...	...	...	1
Status Epilepticus	...	...	...	...	...	...	1
Syphilis	...	...	...	...	...	...	11
Tuberculosis	...	...	...	...	...	...	149
Tumours (malignant)	...	...	...	...	...	...	31
Typhoid fever	...	...	...	...	...	...	6
Undetermined	...	...	...	...	...	...	3

\*6 due to *Staphylococci* and *Streptococci*.

- |   |   |                          |
|---|---|--------------------------|
| 1 | „ | <i>B. Violaceous.</i>    |
| 8 | „ | <i>Coliform bacilli.</i> |
| 1 | „ | <i>B. alkaligenes.</i>   |
| 1 | „ | <i>B. pyocyaneous.</i>   |
| 7 | „ | <i>Streptococci.</i>     |
| 2 | „ | <i>Pneumococci.</i>      |

## APPENDIX B.

## THE MALARIA RESEARCH DIVISION (MALARIA BUREAU).

Malaria Research has been somewhat hampered during the greater part of the year by the absence of a permanent Research Officer. Captain H. M. Pendlebury continued to act in the first half-year, after which Dr. R. Lewthwaite was in charge for a period of three months. The routine and investigatory work that was undertaken reflects great credit on these officers, who were in a position to devote only part of their time to the Division.

The return from vacation leave of the Entomologist, Mr. B. A. R. Gater, in September last, and the arrival, in October, of a newly appointed Malaria Research Officer, Dr. H. O. Hopkins, resulted in a stimulation of activities, though the impending removal to new laboratories has precluded the initiation of any extensive laboratory experiments.

With the augmentation of staff, the Division will no longer confine its activities to the entomological aspect of the malarial problem, but will also interest itself in the pathology, biochemistry and therapeutics of the disease. The attaching of a chemist to work on chemical problems in connection with malarial research should assist in the solution of a number of outstanding questions, and it is hoped that such an arrangement will be possible in the near future.

## INVESTIGATIONS IN RICE FIELDS.

This work was commenced by Professor Williamson when he was in charge of the Bureau, and was carried on by Captain Pendlebury and Mr. B. A. R. Gater.

Enough figures are now available to indicate the variation in the prevalence of various species at different stages of the rice crop, and are of sufficient interest to merit attention. The investigation covers the variations for ten months in the year and the figures given below (Table XV) are based on the collection and identification of 36,170 larvae from rice fields in the Rembau Valley, Negri Sembilan. Ten areas were selected and routine collections made in the fields from September, 1926, to June, 1927. In addition, collections were made outside the rice fields, and 1,444 female imagines were captured in houses. Sufficient data are therefore available to give an estimate of the variation in density of species for the period in question, but the conditions obtaining in the area at this particular time, which determined the relative prevalence, may not necessarily be constant, nor can it be assumed that these figures are typical of other rice fields in the country.

## SPECIES BREEDING IN RICE FIELDS.

A preliminary statement, which has received some criticism, was included in the annual report for 1926. The more comprehensive data which have been accumulated since then confirm Captain Pendlebury's remarks, especially in regard to the dominance, at a certain period, of *Anopheles aconitus* Dön.

Three species, *A. fuliginosus* Giles, *hyrcanus* Pall. var. *nigerrimus* Giles and *barbirostris* V. de Wulp, were continuously present throughout the period, the maximum concentration of anopheline larvae in October being largely due to the dominance of the first-named species, which reached its highest concentration in that month. Both *hyrcanus* and *barbirostris* reached their maxima in November. Thereafter these three species decreased in numbers until after the harvest, when an increase was again noticeable.

No trace of *A. aconitus* was found until the end of November, after which it increased rapidly until just before harvest, when it was the dominant species present. This species persisted to a considerable extent after harvest, and then rapidly diminished in numbers and would probably have disappeared during the months of July and August. As would have been thought, *aconitus* was usually found in fields with flowing water, but 20 per cent. of the captures were taken in stagnant water, and, in some cases, in water which was definitely foul with decaying stubbles. When small pools appeared at harvest-time *A. kochi* Dön. appeared in association with *A. vagus* Dön. At the same period *A. maculatus* Theo. was found breeding within the boundaries of two fields. This was caused by fresh water from wells outside the rice fields flowing into them, and points to a possible danger from this source.



The sudden increase in anopheline population after the rice has been planted out can be accounted for by the fact that at this time the natural enemies of the larvae have not developed sufficiently to keep them in check. As the crop matures, and quite apart from changes affecting the breeding of individual species, the natural enemies increase, with the result that the anopheline fauna decreases until some approximation to a balance is obtained. It would be interesting to compare long and short maturing varieties of rice in this respect.

Taken in conjunction with the figures for imagines captured in houses, the short intense breeding season of *aconitus* suggests that this species is subject to a seasonal periodicity, but sufficient evidence is not available to justify positive assertion.

TABLE XV.

Density of *Anopheles* Larvae shown as "No. per 100 Dips."

Capacity of Dipper 1,300 to 1,500 c.cms.

Total No. of Dips 44,567. Total No. of Larvae caught 36,170.

Species.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.*
<i>fuliginosus</i> ...	62	70	51	43	37	15	9	10	19	27
<i>hyrcanus</i> ...	20	26	31	29	24	8	11	10	12	12
<i>barbirostris</i> ...	11	19	29	22	21	14	11	10	12	18
<i>aconitus</i> ...	—	—	0.5	7	12	21	3	5	5	0.2
<i>kochi</i> ...	—	—	—	—	0.2	0.7	2	—	—	—
<i>vagus</i> ...	—	—	—	—	—	0.1	1	—	0.1	—
<i>maculatus</i> ...	—	—	—	—	—	0.3	—	—	—	—
Total ...	93	115	112	101	94	59	37	35	48	57
Rice Crop ...	Planted out	Growing				Harvest	Fallow			

\* The figures for June do not represent a whole month's collection, and are based on 374 larvae captured in 636 dips only.

#### SPECIES BREEDING OUTSIDE RICE FIELDS.

All the species shown in Table XV, with the addition of *A. karwari* James, were found breeding outside the rice fields during the investigation. Buffalo wallows provided *kochi* and *vagus* in large numbers throughout the period, and *maculatus* was taken in every month except October. It is interesting to note that *aconitus* was not found to any great extent outside the rice fields, and then only during the period when it was breeding vigorously in the fields as well. Too much attention cannot be paid to the relative prevalence of species outside, however, since the investigation was primarily concerned with the rice fields, and collections outside them were only made as a check.

#### SPECIES CAUGHT IN HOUSES.

The collection of imagines in houses cannot be carried out as accurately as collections of larvae, so that the figures in Table XVI have not the same measure of significance. It would appear, however, that *fuliginosus*, although breeding in enormous numbers at the time, is not a house-loving species, and that *vagus* and *aconitus* are. The comparatively small numbers of *hyrcanus* and *barbirostris* taken in houses, although they were breeding vigorously in the rice fields, also point to their not being very domestic in habit.

A curious feature is that *maculatus* was not captured once, although it was known to be breeding during the period. This species is often captured in houses, but not to the extent that would enable it to be called domestic, and Essed (1925) has described it as an "out-of-doors" mosquito.

The species caught most frequently was *aconitus*, but until February, when the first males were taken, the specimens were exclusively females. The capture of males is usually taken to indicate that the breeding place is close to the house, but in the case of the houses in question, only females were captured until the time when

*aconitus* had reached its maximum breeding-rate in the rice fields. Although it was not present in the fields from September to the end of November, female imagines were present in houses. There are two possible explanations for this. Either the females live over the non-breeding season, and there is a definite periodicity in breeding, or the females present in the houses come from breeding places situated at some considerable distance. Hacker (1921) has shown that this species can be captured in large numbers in houses throughout the year; Lamborn (1922) found that it is capable of laying fertilized eggs in every month of the year, and Hacker (1922) has further shown that imagines can be bred from larvae under artificial conditions in each month of the year. Barber (1918) states that this species is capable of long flights.

From the figures in Tables XV and XVI there is evidence that *aconitus* is seasonal in its breeding habits as far as rice fields are concerned, and the females captured in houses during September and October probably came from distant breeding places. It is suggested, as a subject for further investigation, that a migration may take place from one breeding ground to another. This is no uncommon phenomenon among other insects and our present knowledge of the movements of *Anopheles* is meagre.

TABLE XVI.  
FEMALE IMAGINES CAPTURED IN HOUSES.

Species.	Aug.-Sept.	October.	November.	December.	January.	February.*	March.	April.	May.	June.†
<i>aconitus</i> ...	13	46	88	180	131	85	111	32	46	3
<i>vagus</i> ...	289	143	49	25	2	7	3	10	8	3
<i>hyrcanus</i> ...	7	15	36	18	5	—	1	3	2	—
<i>kochi</i> ...	6	7	—	1	—	—	1	13	3	—
<i>fuliginosus</i> ...	—	4	11	11	1	1	—	2	—	—
<i>barbirostris</i> ...	5	6	2	—	1	1	1	4	—	—
<i>karwari</i> ...	—	1	—	—	1	—	—	—	—	—
<i>maculatus</i> ...	—	—	—	—	—	—	—	—	—	—
Total ...	320	222	186	235	141	94	117	64	59	6

\* Males of *aconitus* captured for the first time.

† The figures for June are too small to be of importance and are not the result of a whole month's collection.

TABLE XVII.  
DISSECTION OF IMAGINES FOR MALARIAL PARASITES.  
(All gave negative results.)

<i>Anopheles aconitus</i> ...	419
<i>vagus</i> ...	237
<i>hyrcanus</i> var <i>nigerrimus</i> ...	53
<i>fuliginosus</i> ...	18
<i>barbirostris</i> ...	10
<i>kochi</i> ...	8
<i>karwari</i> ...	1
Total ...	746

REMARKS ON MALARIA.

It is said by various authorities that rice fields are or are not malarious. From the foregoing remarks it will be seen that, as far as Malayan rice fields are concerned, a solution to this problem appears impossible until breeding places outside the rice fields are entirely eliminated. The presence of *maculatus* outside the rice fields vitiates epidemiological work, since it cannot be said that a high malaria rate is due to species bred in the fields or outside, and dissections of imagines caught in houses in the area show little for the same reason. Table XVII shows the numbers of females dissected in Rembau area, and none was found infected. If *aconitus* had been found infected in September or October it could not have been said that the rice fields were responsible.



Of the species concerned, all have been infected experimentally, and all have been found naturally infected in Malaya with the exception of *kochi* and *vagus*. Records with regard to *aconitus* vary, Winoto (1919) having obtained an infection rate of 7.7 per cent. from 91 dissections, whereas Swellengrebel and S. de Graaf (1920) obtained only 14 infections out of 1,775 dissections. The infection rate for *fuliginosus* has always been found to be low, but, if present in enormous numbers, it might become of epidemiological importance. Swellengrebel and S. de Graaf (1920) in a summary of numerous observations give the rate as 0.3 per cent. In the case of *hyrcanus* the records are difficult to interpret owing to the confusion in nomenclature. Eight varieties of this species are recognised, var. *nigerrimus* Giles and var. *peditaeniatus* Leicester being recorded in Malaya, var. *argyropus* Swellengrebel in the Dutch East Indies, var. *sinensis* Wiedemann in China and Japan and var. *nigerrimus* in India. The var. *nigerrimus* is the one probably referred to as *A. sinensis* in most Malayan records, but var. *peditaeniatus* has probably also been included. The latter variety, however, would appear to be rare, if Leicester's statement in regard to the larval structure is correct. Stanton (1914) recorded an infection rate of 2.4 per cent. for *A. sinensis* in Malaya, and Walch (1924) a rate of 11.8 per cent. in the Dutch East Indies. In India, however, *nigerrimus* has never been found infected.

Swellengrebel and S. de Graaf (1920) give an infection rate for *barbirostris* of 0.4 per cent., but Hacker observed 10 infected specimens in 133 dissections and Williamson (1926) obtained 1 out of 52. *A. kochi* has not been found naturally infected in Malaya, but recently in the Dutch East Indies more consideration has been paid to this species as a vector, Walch and Walch Sorgdrager (1921) having obtained an infection rate of 11.5 per cent. Swellengrebel and S. de Graaf (1920) are the only investigators who record natural infections of *vagus*, having observed three infections in 3,721 dissections. Evidence in regard to *karwari* is meagre, and it has not so far been found naturally infected. It is highly susceptible experimentally, and has been suspected on more than one occasion, but epidemiological evidence is difficult of interpretation owing to the association of this species with *maculatus*.

The presence of *maculatus* in the area investigated leads to the belief that it is the species really responsible for malaria in the district, and if the saying that there is a connection between malaria and the rice harvest be true, the presence of *maculatus* in the fields themselves is highly suggestive.

If Alessandrini's (1925) contention be correct, species which breed in rice fields do so under optimum conditions and are less susceptible to infection than when they breed in less suitable waters. He found differences in the measurements of specimens bred in rice fields and marshes, and also in the development of the fat-body. De Buck, Swellengrebel and Schoute (1927) found differences in specimens of the same species coming from two areas in Holland, the one malarious and the other not, and this aspect of the problem merits closer attention.

An opportunity of studying mosquito-breeding in rice fields under absolutely controlled conditions was obtained through the courtesy of the Department of Agriculture, and it is hoped that the investigation will begin in 1928. The Plant Physiologist (Mr. W. N. C. Belgrave) is undertaking a large series of experiments on manuring rice in controlled plots, and the Division will study the occurrence and oecology of *Anopheles* in them.

#### INVESTIGATION IN PETALING VILLAGE.

At the request of the Health Officer, Kuala Lumpur, a larval survey was made in this area in August, and again in October. On the first occasion *barbirostris*, *vagus*, *aconitus* and *kochi* were found, the last two in small numbers only. On the second occasion, in addition to the above, *hyrcanus*, *umbrosus* Theo. and *fuliginosus* were discovered. On both occasions *barbirostris* was the dominant species, followed by *vagus* and *hyrcanus*.

Collections of imagines in houses in the village yielded 893 specimens, with *barbirostris* again dominant, but followed in point of numbers by *aconitus* and *tessellatus* Theo. whose breeding places had not been found. Of these, 721 were dissected for malarial parasites, with negative results except in the case of two *aconitus* in which oocysts were found (Table XVIII).

Several specimens of *aconitus*, including one in which oocysts were found, were infested with Trypanosomids showing *Crithidia* forms in the mesenteron and a few *Leishmania* forms (?cysts) in the proctodeum. At the time Thomson and Robertson's (1925) description of a *Crithidia* form in *A. umbrosus* from Malaya, had escaped attention, and no comparison with the form in *aconitus* was made.

TABLE XVIII.

## DISSECTIONS OF IMAGINES FROM PETALING VILLAGE FOR MALARIAL PARASITES.

Species.	Number dissected.	Negative.	Positive.	Remarks.
<i>Anopheles barbirostris</i> ...	262	262	—	—
<i>aconitus</i> ...	192	190	2	Oocysts only
<i>tessellatus</i> ...	148	148	—	—
<i>vagus</i> ...	74	74	—	—
<i>hyrcanus</i> var				
<i>nigerrimus</i> 31	31	31	—	—
<i>kochi</i> ...	11	11	—	—
<i>fuliginosus</i> ...	1	1	—	—
<i>umbrosus</i> ...	2	2	—	—
Total ...	721	719	2	—

## ROUTINE FIELD AND LABORATORY WORK.

Breeding places described	...	...	...	...	1,513
Larvae identified	...	...	...	...	21,612
Imagines bred out and identified	...	...	...	...	1,296
Imagines caught in houses	...	...	...	...	1,887
Dissections for malarial parasites	...	...	...	...	1,004

## REPORTS.

Four comprehensive mosquito surveys were made during the year to assist the Health Department, which was unable to undertake the work.

Twenty-six miscellaneous reports on larvae and imagines and other matters connected with malaria were issued, and the toxicity of certain larvicidal substances was examined.

## EXHIBITIONS.

The Division assisted at three Agri-Horticultural Shows, exhibits dealing with the life-history and control of mosquitoes having been arranged. Judged by the enquiries which result these exhibits are successful in stimulating interest in the mosquito problem, but they tend to interfere with research work. It is hoped to organize these exhibits in the future so that the minimum amount of time and labour need be expended.

## COLLECTIONS.

Nine collections of the more common species of *Anopheles* were sent to Health Officers and others during the year, and a certain amount of material was forwarded to scientific institutions. It would be preferable if Health Officers made their own collections and forwarded them to the Institute for identification. If this were done the Division would benefit by obtaining data on the distribution and occurrence of the rarer species. The surplus collection has diminished to such an extent that it is now difficult to send out complete series of specimens. This is being remedied by special collection, but it will be some time before collections can be issued broadcast as in the past.

## GENERAL.

Considerable time has been expended in training the staff in laboratory technique and preparing for the removal to new laboratories at the Institute for Medical Research, which should take place early in 1928.

While Mr. B. A. R. Gater was on vacation he was enabled to work at the Molteno Institute, Cambridge, the London School of Tropical Medicine and the British Museum. He also visited numerous other research centres, including the British Mosquito Control Institute at Hayling Island, and we have to acknowledge the generous assistance and facilities afforded him by the staffs of these institutions.



## APPENDIX C.

## THE CHEMICAL DIVISION.

Mr. H. Marsden, B.Sc., A.I.C., who is acting for the Chief Chemist, reports that the work done during the year included chemical analyses and investigations for the following departments: Medical, Trade and Customs, Police, Railway, Public Works, Forest, Electrical, and Posts and Telegraphs.

The total number of samples examined during the year was 13,555 as compared with 7,756 in 1926, an increase of 5,799. The increase is chiefly due to the large increase in the number of samples of chandu dross examined. There are also considerable increases in the numbers of waters, toddies and stained articles. There are decreases in the numbers of coins, milks, and exhibits for toxicological examination. (Table XX.)

## SPECIMENS FROM THE MEDICAL DEPARTMENT.

Samples analysed for the Medical Department may be classed under the following heads:

- (1) Milks;
- (2) Waters;
- (3) Sewage effluents;
- (4) Toddies;
- (5) Exhibits for toxicological analysis;
- (6) Miscellaneous articles.

(1) *Milks*.—Samples are submitted by officers of the Health Branch, and also by officers of Sanitary Boards. All samples are taken under the provisions of "The Sale of Food and Drugs Enactment, 1913," and are analysed to ascertain if they comply with the standards prescribed in the rules under that Enactment.

Five hundred and seven samples were analysed. Of these 75, or 15 per cent., were unsatisfactory, as compared with 13 per cent. in 1926 when 597 samples were analysed, and 33 per cent. in 1920 when 315 samples were analysed. If the results of analysis obtained in this laboratory are a correct index of the quality of the milk sold, there has been a considerable improvement in the quality of the milk supply in the last seven years.

The total number of samples from each State, and the numbers and percentage of unsatisfactory samples, are shown in the following table:

TABLE XIX.

State.	Total samples.	Unsatisfactory samples.	
		Number.	Percentage.
Perak ... ..	150	17	11
Selangor ... ..	345	58	17
Negri Sembilan ... ..	10	0	—
Pahang ... ..	2	0	—

Fifteen of the unsatisfactory samples were deficient in milk fat, 54 were deficient in non-fatty solids, and six were deficient in both fat and non-fatty solids.

(2) *Waters*.—The total number of samples of water from existing or proposed domestic supplies examined chemically was 818 as compared with 528 in 1926. Seventy-six samples were examined bacteriologically.

The raw and filtered waters from the two supplies which serve Kuala Lumpur were examined weekly. The monthly averages of these analyses will be found in Table XXI (page 67). The yearly averages for the last seven years are shown in Tables XXII, XXIII, XXIV and XXV (pages 68 and 69).

Last year, arrangements were made for monthly analyses of samples of water from the following supplies: Bagan Datoh, Bagan Serai, Batu Gajah, Gopeng, Ipoh, Kajang, Kampar, Klang, Kuala Kangsar, Kuala Kubu, Parit Buntar, Rawang, Seremban, Taiping, Tanjong Rambutan, Tapah and Teluk Anson. These arrangements were continued throughout the year under review. In a few cases samples were not sent regularly. Two of the above supplies are filtered through mechanical filters and nine through sand filters. As judged by the results of chemical analyses, both the waters filtered through mechanical filters were improved by the treatment, but only one water filtered through sand was better than the raw water. Of the remaining eight supplies treated by sand filtration, three of the filtered waters were always worse than the corresponding raw waters and five were sometimes better and sometimes worse.



(3) *Sewage Effluents*.—Twenty-six samples of sewage effluents were examined. Most of these were unsatisfactory. A considerable number of new sewage purification installations were erected during the year, but the effluents from many of these have not yet been examined. It is proposed to undertake this work early in 1928.

(4) *Toddies*.—One hundred and fifty-seven samples of toddy were analysed to ascertain if they complied with the standards prescribed in the rules under "The Sale of Food and Drugs Enactment, 1913." All the samples were satisfactory in this respect, but 76 of them were suspected to be mixed with water.

(5) *Toxicological Analyses*.—Fifteen exhibits were submitted by officers of the Medical Department. Exhibits in connection with cases of suspected human poisoning numbered nine. These included six viscera, in only one of which poison was found, the poison being caustic potash.

In connection with cattle poisoning three viscera were examined, in one of which arsenic was found. One sample of blood was examined for hydrocyanic acid, with negative results.

(6) *Miscellaneous Exhibits*.—The total number of exhibits was 53. Thirty-five samples of flour were examined for adulteration with sand. In some of these the quantity of sand was greater than is found in European or American roller-milled flours, but no evidence of wilful adulteration was found.

Six drugs supposed to be quinine were found to be aspirin.

Radion Alfa, a proprietary remedy for malaria, was analysed. Other exhibits included one sample of tobacco, one sample of ether which was found to contain ethyl acetate, one condensed milk, pills which were found to contain opium, one vinegar, one faeces, one test meal and six samples of urine examined for the presence of arsenic, all with negative results.

*Vitamin B. Extract*.—The preparation of this extract from rice polishings was continued throughout the year. Although the original apparatus has been quadrupled it was necessary to keep the plant running on every working day in order to cope with the increased demand for extract. Owing to the loss of vegetables and local padi caused by the floods in December, 1926, very heavy demands for the extract were received in January, 1927. In anticipation of a repetition of floods at the end of 1927, heavy demands were again made during November and December. Considerable stocks had been accumulated for this purpose, and by the middle of December all demands had been met.

The total quantity of extract prepared was 28,360 fluid ounces, of which 27,680 fluid ounces were issued, as compared with 8,606 ounces prepared and 8,960 ounces issued in 1926.

An extract of rice polishings is now prepared in Java. The anti-beri-beri vitamin from this extract is adsorbed on acid clay obtained from Cheribon. The expense of concentration is thus obviated, and the product is obtained as a powder which is made into tabloids.

An attempt was made in this laboratory to adsorb the anti-beri-beri vitamin on purified kaolin. The product obtained was of little value. A supply of Javanese acid clay has been ordered, but had not yet arrived at the end of the year.

#### SPECIMENS FROM THE TRADE AND CUSTOMS DEPARTMENT.

The work for this department consists chiefly in the examination of samples of chandu and chandu dross, and in the analysis of samples of toddy. Samples of imported liquors are also received for the determination of alcoholic strength in connection with the assessment of import duties.

(1) *Chandu*.—Four hundred and twenty-six samples of chandu and substances suspected to be chandu were examined. Two hundred and eleven of these were found to be Government chandu, 109 were illicit chandu, 18 re-prepared chandu, and 34 imitation chandu containing no opium. The remaining substances were chandu dross, in some cases kneaded with water to produce substances resembling chandu.

(2) *Chandu Dross*.—All chandu dross returned to chandu officers is examined and graded by a Chemist from this laboratory. The number of samples examined during the year was 9,894 as compared with 4,419 in 1926. Four hundred and forty-three of these were found to be of poor quality, and 43 were adulterated.



(3) *Toddy*.—Owing to the increased supervision of toddy-shops there was a large increase in the number of samples of toddy examined.

Under the present regulations it is an offence to sell toddy in which:

- (a) the alcoholic content exceeds 10 per cent. by volume.
- (b) the acidity exceeds 0.8 per cent. expressed as acetic acid.

These regulations were adopted to prevent

- (a) the fortification of toddy with spirits.
- (b) the sale of very old toddy.

The prohibition of the sale of old toddy can be evaded by mixing old toddy with water. Hitherto there has been no satisfactory method of detecting the addition of water to toddy. As a result of an investigation commenced 1926 a method of analysis has been devised which, although not infallible, does give an indication of watering in the majority of cases. This method of analysis has been applied to all toddy samples in 1928. The adoption of this method has involved a considerable increase in the work under this heading, in addition to the increase due to the larger number of samples examined. Towards the end of the year an investigation was undertaken to obtain information about the effect of weather on the yield and composition of toddy, especially with reference to rainstorms. This investigation is still in progress.

The total number of samples examined was 849 as compared with 171 in 1926. One hundred and seventy-nine of these were in connection with special investigations and 670 were samples submitted by officers of the Excise Department. All these samples satisfied regulations (a) and (b) above, but 263 samples gave indications of adulteration with water.

(4) *Liquors*.—Alcohol was estimated in 58 samples. Seven samples of spirits were examined for denaturants. All, except one, were found to be satisfactorily denatured.

(5) *Deleterious Drugs*.—Seven substances were examined for the presence of deleterious drugs. Morphine was found in one.

(6) *Miscellaneous Samples*.—Nineteen samples of turpentine were examined, of which nine were found to consist wholly or in part of mineral terpene which is liable to duty under the Petroleum Enactment. Other substances included seven samples of alum and three of ganja.

#### SPECIMENS FROM THE POLICE DEPARTMENT.

Four hundred and seventy-two exhibits were received from police officers. These may be classified as follows:

- (1) Coins and coining materials;
- (2) Articles for blood stains;
- (3) Specimens for toxicological analysis;
- (4) Deleterious drugs;
- (5) Miscellaneous exhibits.

(1) *Coins and Coining Material*.—The number of exhibits was 175 as compared with 1,077 in 1926. Of these, 139 were counterfeit coins, 14 moulds, and 18 other accessories used by coiners.

(2) *Articles for Blood-stains*.—The number of exhibits received was 177. Blood was found on 74 of these. Seventy-one of the exhibits which gave positive reactions for blood were further examined by the precipitin test. Sixty-six stains gave the reaction for human serum and one gave the reaction for buffalo serum.

(3) *Specimens for Toxicological Analysis*.—The total number of exhibits was 37. Of these, 13 were human viscera. None of the cases presented any specially interesting features. Acetic acid was found in two viscera and morphine in two. Morphine was also found in a stomach wash. Arsenic was found in two specimens of vomit, and arsenic mixed with crushed glass in a powder. A dog poison was found to contain strychnine.

(4) *Deleterious Drugs*.—Three exhibits were examined with negative results.

(5) *Miscellaneous Exhibits*.—These included 55 specimens of ganja, five alcoholic liquors, four samples of ghee, various exhibits for acid stains, and currency notes examined for the presence of adhesives.

## SPECIMENS FROM OTHER DEPARTMENTS.

Samples submitted by the Railway Department included 19 white metal alloys, 9 cylinder oils, 12 samples of rock for concrete aggregate, 4 boiler waters, and 12 samples of water for domestic purposes.

For the Public Works Department, samples of water for domestic supplies and for steam raising were examined.

Samples of Dragon's blood and of water were examined for the Forest Department.

Lubricating oil was examined for the Electrical Department.

Moisture was estimated in a cylinder of carbon dioxide for the Post and Telegraph Department, and in a sample of rifle grease for the Volunteer Forces.

The Meteorological Station established in 1926 was maintained throughout the year.

Four patent specifications were examined.

## PRIVATE ANALYSIS.

The total number of samples examined was 76. These included 59 samples of water for domestic purposes and eight boiler waters.

## LEGAL PROCEEDINGS.

Members of the staff attended Criminal Courts in various parts of the country on 27 occasions.

TABLE XX.

Total number of samples examined in the Chemical Laboratory during the years 1926 and 1927:

	1926.	1927.
<i>Medical Department—</i>		
Milk, Chemical ... ..	597	507
Milk, Bacteriological ... ..	3	0
Water, Chemical ... ..	528	818
Water, Bacteriological ... ..	99	76
Sewage Effluents ... ..	10	26
Toddy ... ..	171	157
Toxicological analyses ... ..	13	15
Miscellaneous ... ..	37	53
<i>Trade and Customs Department—</i>		
Liquors ... ..	96	58
Toddy ... ..	171	849
Chandu ... ..	204	426
Chandu Dross ... ..	4,419	9,894
Deleterious Drugs ... ..	2	7
Miscellaneous ... ..	29	34
<i>Police Department—</i>		
Coins and coining material ... ..	1,077	175
Articles for blood-stains ... ..	96	177
Toxicological analyses ... ..	49	37
Liquors ... ..	—	5
Deleterious Drugs ... ..	2	3
Miscellaneous ... ..	35	75
<i>Other Departments—</i>		
Miscellaneous ... ..	69	87
<i>Private Analyses—</i>		
Water ... ..	40	67
Miscellaneous ... ..	9	9
Total ...	<u>7,756</u>	<u>13,555</u>



TABLE XXI.

KUALA LUMPUR WATER SUPPLY.

Chemical Averages for each month of the year 1927. Parts per 100,000 unless otherwise stated.

Month.	Impounding Reservoir. (Raw Water.)							Intake Works, Ampang. (Raw Water.)										
	Colour M. M.	pH	Ammoniacal nitrogen.	Albuminoid nitrogen.	Oxygen absorbed in 3 hrs.	Chlorine.	Total solids.	Oxidized nitrogen.	Rainfall in inches.	Colour M. M.	pH	Ammoniacal nitrogen.	Albuminoid nitrogen.	Oxygen absorbed in 3 hrs.	Chlorine.	Total solids.	Oxidized nitrogen.	Rainfall in inches.
January ...	36	7.0	.0012	.0102	.1180	.07	4.75	.004	10.31	38	6.5	.0005	.0097	.1417	.06	5.75	.012	11.75
February ...	28	7.0	.0005	.0092	.1195	.07	5.00	.000	6.05	30	7.0	.0003	.0076	.1307	.06	4.00	.000	5.00
March ...	30	7.0	.0003	.0090	.1261	.07	3.50	.000	9.52	38	7.0	.0003	.0086	.1631	.06	3.25	.000	8.65
April ...	35	7.0	.0011	.0125	.1436	.08	4.00	.003	18.51	38	7.0	.0005	.0091	.1639	.06	3.50	.006	16.96
May ...	27	6.7	.0007	.0128	.1374	.07	4.25	.004	13.68	30	6.7	.0001	.0092	.1300	.06	4.00	.002	10.93
June ...	36	7.0	.0001	.0127	.1306	.08	6.50	.000	4.34	32	7.0	.0001	.0070	.1258	.06	6.00	.004	3.48
July ...	38	7.0	.0004	.0114	.1355	.07	4.75	.002	4.33	40	6.9	.0001	.0071	.1237	.06	5.50	.003	6.69
August ...	29	7.0	.0001	.0102	.1250	.07	3.25	.000	6.44	32	6.8	.0010	.0128	.1861	.07	4.50	.004	8.46
September ...	33	6.7	.0004	.0100	.1480	.07	4.50	.002	13.91	43	6.7	.0003	.0125	.2362	.06	4.50	.002	14.07
October ...	39	6.9	.0001	.0092	.1559	.07	2.75	.002	14.41	36	6.7	.0001	.0109	.1756	.06	4.00	.006	13.80
November ...	30	6.7	.0007	.0107	.1424	.07	6.50	.002	11.22	24	6.5	.0001	.0078	.1237	.06	5.50	.002	12.42
December ...	27	7.0	.0006	.0102	.1277	.08	3.85	.002	11.17	25	6.7	.0004	.0075	.1151	.06	3.40	.002	15.99
Averages ...	32	6.9	.0005	.0107	.1341	.07	4.46	.002	10.32	34	6.8	.0003	.0091	.1513	.06	4.49	.004	10.68

Month.	Maxwell's Hill Reservoir. (Filtered Water.)							Weld Hill Reservoir. (Filtered Water.)								
	Colour M. M.	pH	Ammoniacal nitrogen.	Albuminoid nitrogen.	Oxygen absorbed in 3 hrs.	Chlorine.	Total solids.	Oxidized nitrogen.	Colour M. M.	pH	Ammoniacal nitrogen.	Albuminoid nitrogen.	Oxygen absorbed in 3 hrs.	Chlorine.	Total solids.	Oxidized nitrogen.
January ...	17	6.5	.0000	.0034	.0635	.07	4.00	.018	20	7.0	.0000	.0032	.0583	.06	4.00	.006
February ...	17	6.5	.0002	.0043	.0625	.07	3.75	.000	22	7.0	.0001	.0038	.0795	.06	4.50	.000
March ...	18	7.0	.0002	.0039	.0571	.07	3.25	.000	28	7.0	.0002	.0036	.0919	.06	3.25	.000
April ...	25	6.5	.0005	.0046	.0768	.07	3.00	.003	24	7.5	.0001	.0034	.0672	.06	3.00	.006
May ...	17	6.6	.0000	.0040	.0663	.07	3.00	.008	18	7.1	.0001	.0030	.0670	.06	3.50	.006
June ...	23	6.5	.0001	.0056	.0752	.07	5.00	.004	18	7.3	.0000	.0036	.0777	.06	5.00	.002
July ...	17	6.6	.0001	.0040	.0695	.07	4.00	.003	26	7.4	.0001	.0042	.0851	.06	4.25	.006
August ...	13	6.7	.0000	.0033	.0626	.06	2.75	.002	23	7.3	.0002	.0036	.1081	.06	5.75	.002
September ...	14	6.5	.0003	.0034	.0756	.07	4.25	.003	28	7.1	.0003	.0043	.1140	.06	3.75	.002
October ...	22	6.5	.0002	.0057	.0938	.07	3.00	.006	23	7.0	.0001	.0034	.1018	.06	3.00	.006
November ...	16	6.5	.0000	.0035	.0819	.07	4.75	.002	15	7.0	.0000	.0028	.0807	.06	3.25	.004
December ...	15	6.5	.0003	.0038	.0619	.07	4.70	.002	16	7.0	.0003	.0029	.0792	.06	3.60	.004
Averages ...	18	6.6	.0002	.0041	.0706	.07	3.79	.004	22	7.1	.0001	.0035	.0842	.06	3.90	.004

TABLE XXII.

AVERAGES, YEARS 1921-1927.

KUALA LUMPUR WATER SUPPLY: IMPOUNDING RESERVOIR AT AMPANG (RAW WATER)  
(HIGH LEVEL SUPPLY).

Parts per 100,000 (unless otherwise stated).

Years 1921-1927.			Ammoniacal nitrogen.	Albuminoid nitrogen.	Oxidized nitrogen.	Chlorides as chlorine.	Oxygen ab- sorbed from permanga- nate 3 hours at 80°F.	Colour M.M. Brown in a 2 foot tube.	Total solids.	Rainfall in inches.	Reaction pH
1921	...	...	.0006	.0124	.002	.06	.1619	...	4.0	...	...
1922	...	...	.0009	.0131	.003	.07	.1641	...	4.4	8.07	...
1923	...	...	.0007	.0116	.004	.07	.1736	22	4.0	8.41	...
1924	...	...	.0006	.0111	.002	.07	.1516	21	4.3	7.61	...
1925	...	...	.0005	.0102	.004	.07	.1484	26	4.5	11.53	7.5
1926	...	...	.0004	.0106	.003	.07	.1521	29	3.8	9.21	6.5
1927	...	...	.0005	.0107	.002	.07	.1341	32	4.5	10.32	6.9
Averages for 7 years			.0006	.0114	.003	.07	.1551	26	4.2	9.19	7.0

TABLE XXIII.

AVERAGES, YEARS 1919-1927.

KUALA LUMPUR WATER SUPPLY: MAXWELL'S HILL (FILTERED WATER)  
(HIGH LEVEL SUPPLY).

Parts per 100,000 (unless otherwise stated).

Years 1919-1927.			Ammoniacal nitrogen.	Albuminoid nitrogen.	Oxidized nitrogen.	Chlorides as chlorine.	Oxygen ab- sorbed from permanga- nate 3 hours at 80°F.	Colour M.M. Brown in a 2 foot tube.	Total solids.	Reaction pH	Hardness (total).
1919	...	...	.0010	.0094	.010	.08	.0741	...	...	...	...
1920	...	...	.0005	.0074	.010	.06	.0834	...	3.5	...	1.6
1921	...	...	.0001	.0047	.011	.06	.0828	...	3.1	...	...
1922	...	...	.0001	.0047	.007	.07	.0835	...	3.4	...	...
1923	...	...	.0002	.0043	.006	.07	.1049	18	3.5	...	...
1924	...	...	.0008	.0055	.004	.06	.0897	17	3.6	...	...
1925	...	...	.0001	.0056	.005	.07	.0850	19	4.0	7.0	...
1926	...	...	.0000	.0041	.005	.07	.0768	16	3.2	6.0	.1
1927	...	...	.0002	.0041	.004	.07	.0706	18	3.8	6.6	...
Averages for 9 years			.0003	.0055	.007	.07	.0834	18	3.7	6.5	.9



TABLE XXIV.

AVERAGES, YEARS 1921-1927.

KUALA LUMPUR WATER SUPPLY: AMPANG INTAKE WORKS (RAW WATER)  
(LOW LEVEL SUPPLY).

Parts per 100,000 (unless otherwise stated).

Years 1921-1927.			Ammoniacal nitrogen.	Albuminoid nitrogen.	Oxidized nitrogen.	Chlorides as chlorine.	Oxygen ab- sorbed from permanga- nate 3 hours at 80°F.	Colour M.M. Brown in a 2 foot tube.	Total solids.	Rainfall in inches.	Reaction pH
1921	...	...	.0005	.0055	.003	.06	.1555	...	5.1	...	...
1922	...	...	.0006	.0067	.004	.06	.1762	...	3.8	9.22	...
1923	...	...	.0008	.0071	.005	.06	.1859	24	4.0	8.74	...
1924	...	...	.0008	.0051	.005	.05	.1562	24	4.3	8.28	...
1925	...	...	.0005	.0066	.006	.06	.1709	27	4.2	12.07	7.5
1926	...	...	.0003	.0071	.005	.06	.1764	30	3.8	9.88	6.5
1927	...	...	.0003	.0091	.004	.06	.1513	34	4.5	10.68	6.8
Averages for 7 years			.0005	.0067	.005	.06	.1675	28	4.2	9.81	6.9

TABLE XXV.

AVERAGES, YEARS 1919-1927.

KUALA LUMPUR WATER SUPPLY: WELD HILL (FILTERED WATER)  
(LOW LEVEL SUPPLY).

Parts per 100,000 (unless otherwise stated).

Years 1919-1927.			Ammoniacal nitrogen.	Albuminoid nitrogen.	Oxidized nitrogen.	Chlorides as chlorine.	Oxygen ab- sorbed from permanga- nate 3 hours at 80°F.	Colour M.M. Brown in a 2 foot tube.	Total solids.	Reaction pH	Hardness (total).
1919	...	...	.0010	.0078	.010	.08	.1113	...	...	...	...
1920	...	...	.0005	.0064	.009	.07	.1267	...	6.0	...	1.6
1921	...	...	.0002	.0044	.007	.06	.1206	...	4.4	...	...
1922	...	...	.0001	.0048	.005	.06	.1329	...	3.5	...	...
1923	...	...	.0002	.0046	.007	.06	.1465	22	3.6	...	...
1924	...	...	.0003	.0033	.006	.05	.1155	21	3.8	...	...
1925	...	...	.0001	.0044	.006	.06	.1054	23	4.0	8.0	...
1926	...	...	.0000	.0044	.005	.06	.1087	22	3.9	7.5	.4
1927	...	...	.0001	.0035	.004	.06	.0842	22	3.9	7.1	...
Averages for 9 years			.0003	.0048	.007	.06	.1169	22	4.1	7.5	1.0

## PUBLICATIONS.

The following publications were issued from the Institute during the year:

(a) *Bulletins from the Institute for Medical Research—*

- No. 1.—The Tsutsugamushi Disease in the Federated Malay States, by William Fletcher and J. W. Field.  
 No. 2.—Notes on Diphtheria in the Federated Malay States, by William Fletcher.  
 No. 3.—The Bacteriophage in the Treatment of Bacillary Dysentery of the Flexner Type, by William Fletcher and K. Kanagarayer.  
 No. 4.—Notes on the Epidemiology of Enteric Fevers in the Federated Malay States, by William Fletcher.  
 No. 5.—Plasmochin in the Treatment of Malaria, by William Fletcher and K. Kanagarayer.

(b) *Other Papers—*

- (1) Plasmochin in the Treatment of Malaria, by William Fletcher and K. Kanagarayer, *Indian Medical Gazette*, 1927.  
 (2) Serum Prophylaxis in Measles. An Evaluation of the Resulting Immunity, by A. Neave Kingsbury. *Lancet*, 1927.  
 (3) The Serum Prophylaxis of Measles, by A. Neave Kingsbury. *Journal of Hygiene*, 1927.  
 (4) An Attempt to Transit *L. icterohaemorrhagiae* by *A. argenteus* and *A. albopictus*, by A. Neave Kingsbury. Proceedings of the Seventh Congress, Far Eastern Association of Tropical Medicine.  
 (5) Scrotal Cancer in a Tamil employed on Anti-Malarial Oiling, by A. Neave Kingsbury. *Journal of Pathology and Bacteriology*, 1927.  
 (6) On Canine Anti-Rabies Vaccination in Malaya, by A. Neave Kingsbury.  
 A paper submitted to the Rabies Conference organised by the Health Organisation, League of Nations, and held in Paris, April, 1927.  
 (7) The Serum Treatment of Acute Dysentery Infections, by A. Neave Kingsbury and K. Kanagarayer. *Malayan Medical Journal*, 1927.  
 (8) On Enteric Fevers, including a Report of two cases of *B. Paratyphosus C* Infection, by A. Neave Kingsbury, J. E. Lesslar and M. Kandiah. *Malayan Medical Journal*, 1927.  
 (9) Water and Its Purification, by R. W. Blair. *Malayan Medical Journal*, 1927.  
 (10) Japanese River Fever, by R. Lewthwaite. *Malayan Medical Journal*, 1927.  
 (11) Some Unusual Manifestations of Infection with *Ascaris*, by K. Kanagarayer. *Malayan Medical Journal*, 1927.  
 (12) Encephalitis Lethargica in Malaya, by K. Kanagarayer. *Malayan Medical Journal*, 1927.  
 (13) Spirochaetal Pulmonary Gangrene, by K. Kanagarayer. *Malayan Medical Journal*, 1927.  
 (14) How to distinguish Albumen from Quinine in Mayer's Test, by M. Kandiah. *Malayan Medical Journal*, 1927.

## STAFF CHANGES.

Dr. W. Fletcher, the Director, proceeded on leave prior to retirement, in August. He has since been appointed Secretary to the Colonial Medical Research Committee.

Dr. A. Neave Kingsbury, formerly Professor of Bacteriology, King Edward VII College of Medicine, was appointed Bacteriologist on April 12th, and Director on October 14th.

Mr. R. W. Blair was appointed Chief Chemist on March 25th, and proceeded on vacation leave on November 25th.

Dr. R. T. B. Green was appointed Pathologist II from March 27th, 1926.

Dr. R. Lewthwaite was appointed Research Student in Tropical Medicine, and assumed duty on January 2nd. He acted as Malaria Research Officer from June 22nd to September 21st.

Captain H. M. Pendlebury, F.E.S., Systematic Entomologist, Museums Department, acted as Malaria Research Officer from January 1st until June 21st.

Mr. B. A. R. Gater, Malaria Research Officer, returned from vacation leave on September 22nd, and was appointed Entomologist, Institute for Medical Research, on November 10th.

Dr. H. O. Hopkins was appointed Malaria Research Officer, and assumed duty on October 7th.

Dr. I. A. Simpson was appointed Assistant Chemist, and assumed duty on November 4th.

Mr. Sadashiva Rao R. Savor was appointed Assistant Surgeon, and assumed duty on November 26th.

KUALA LUMPUR,  
January, 1928.

A. N. KINGSBURY,  
Director, Institute for Medical Research, F.M.S.



## APPENDIX D.

REPORT OF THE CHIEF HEALTH OFFICER, FEDERATED  
MALAY STATES, FOR THE YEAR 1927.

## HEALTH STAFF.

## 1. The sanctioned staff for the year was:

## EUROPEAN OFFICERS.

Chief Health Officer, Federated Malay States	...	...	...	1
Senior Health Officer, Selangor and Pahang	...	...	...	1
Senior Health Officer, Perak	...	...	...	1
Senior Health Officer, Negri Sembilan	...	...	...	1
Health Officers	...	...	...	19
Chief Sanitary Inspectors	...	...	...	8

## ASIATIC OFFICERS.

Assistant Health Officers	...	...	...	...	...	8
Health Inspectors	...	...	...	...	...	45

2. The title of Senior Health Officer, Federated Malay States, was changed to that of Chief Health Officer, Federated Malay States, on the 19th February, 1927, and three new appointments were created on the same date, viz., the Senior Health Officer, Selangor and Pahang, the Senior Health Officer, Perak, and the Senior Health Officer, Negri Sembilan.

3. Of the Health Officers there were 12 available, of whom four were Medical Officers lent from the Medical Department.

4. There were two Chief Sanitary Inspectors, one was stationed at Tapah to supervise the anti-malarial works in connection with the road to Cameron's Highlands Plateau (4,750 feet) and the other was stationed at the Health Office, Ipoh.

5. There were six Assistant Health Officers whose duties are principally in the towns assisting the Health Officers and to inspect dead bodies, they are stationed one each at Ipoh and Taiping, and two for Seremban (pending one going on leave) and two at Kuala Lumpur.

6. There were eight Health Inspectors appearing for the Royal Sanitary Institute Examination held from the 31st October to the 3rd November, 1927, at Singapore, of whom four Health Inspectors passed and gained the Certificate.

7. The following were the principal changes which took place during the year:

Dr. A. R. Wellington, Chief Health Officer, Federated Malay States, proceeded on long leave on the 14th February, 1927, and resumed duty on the 12th October, 1927.

On the 24th November, 1927, he went to India as Government delegate to the F.E.A.T.M. and afterwards to attend as Official Member of the Advisory Council to the League of Nations, Eastern Health Bureau, Delhi, India.

8. Dr. A. K. Cosgrave, M.C., Senior Medical Officer, Selangor, was acting as Senior Health Officer, Federated Malay States, while Dr. A. R. Wellington was on leave. On 19th February, 1927, when the new appointment of Senior Health Officer, Selangor and Pahang, was created he was confirmed in that appointment. At the same time he was acting as Chief Health Officer, Federated Malay States, till 12th October, 1927, when Dr. A. R. Wellington returned.

Again on the 24th November he was acting for Chief Health Officer, Federated Malay States, when the latter went to India, in addition to his own duties.

9. Dr. F. R. Sayers, Senior Health Officer, Penang, was appointed as Senior Health Officer, Perak, with effect from the 19th February, 1927.

10. Dr. E. H. Black, Health Officer, Lower Perak and Batang Padang, was appointed to act as Senior Health Officer, Negri Sembilan, with effect from the 24th October, 1927.

11. Dr. W. O. Pou, Health Officer, Lower Perak and Batang Padang, was transferred to Kuala Lumpur as Health Officer on the 20th April, 1927.

12. Dr. C. S. Ryles, o.B.E., Health Officer, Negri Sembilan, was transferred to act as Health Officer, Lower Perak and Batang Padang, on the 22nd October, 1927.

13. Dr. D. W. G. Faris, Health Officer, Klang, till the 31st January, 1927, was transferred to act as Health Officer, Pahang East, Kuantan, from the 1st February, 1927.

14. Dr. E. A. Struthers, Health Officer, Port Swettenham, till the 27th March, 1927, was transferred to act as Health Officer, Seremban, from the 28th March.

15. Dr. E. R. C. Cooke, m.c., returned from long leave on the 25th March, 1927, and was posted as Health Officer, Klang and Port Swettenham, from the same date.

#### APPOINTMENTS.

16. Dr. R. A. Pallister was appointed Health Officer on the 25th August, 1927, and was attached to the Health Office at Seremban.

17. Dr. S. Venkatachalam was appointed Assistant Surgeon on the 14th October, 1927, and was posted to the Health Office at Seremban as Assistant Health Officer. He arrived here on 21st October, 1927, from Madras.

18. Dr. R. K. Thirupad was appointed Assistant Surgeon on the 16th November, 1927, and was detailed for duty to the Health Office, Kuala Lumpur, as Assistant Health Officer. He arrived here on 26th November, 1927, from Madras.

#### DEATH.

19. I regret to have to record the death of Dr. P. G. Temple, late Health Officer, Lower Perak, which took place on the 24th January, 1927, while he was on long leave.

#### DUTIES OF THE HEALTH BRANCH.

20. The duties of the members of the Health Branch include:

- (i) Vital statistics and work under the Registration of Births and Deaths Enactment;
- (ii) Malaria investigation and mosquito control;
- (iii) Work under the following Enactments:
  - (a) Quarantine and Prevention of Disease Enactment;
  - (b) Sanitary Boards Enactment;
  - (c) Sale of Food and Drugs Enactment;
  - (d) Labour Code;
- (iv) General, including inspection of schools, Government cooly lines, waterworks, etc.;
- (v) Maternity and Infant Welfare.

#### REVENUE AND EXPENDITURE.

21. The only revenue collected was that for certificates issued under the Births and Deaths Registration Enactment, and of the sale of mosquito identification books. The total amount collected during the year was \$2,880.

22. The expenditure debited against the Health Branch was:

Personal Emoluments	...	...	...	...	\$236,190.29
Temporary Allowances	...	...	...	...	38,697.44
Other Charges, Annually Recurrent	...	...	...	...	118,187.29
Other Charges, Special Expenditure	...	...	...	...	3,927.49
					<hr/>
					\$397,002.51
Clerical Service	...	...	...	...	44,501.58
					<hr/>
Total	...	...	...	...	\$441,504.09
					<hr/>



## HEALTH LEGISLATION.

23. The following amendments were passed during the year under "The Labour Code, 1923":

- (a) *Gazette* Notification No. 299 of the 7th January, 1927
- (b) " " 5000 " 16th September, 1927
- (c) " " 5293 " 30th September, 1927
- (d) " " 6391 " 25th November, 1927

under "The Sanitary Boards Enactment, 1916":

- (a) *Gazette* Notification No. 240 of January 7, 1927
- (b) " " 838 " February 4, 1927
- (c) " " 2451 " April 29, 1927
- (d) " " 4585 " August 19, 1927
- (e) " " 6255 " November 10, 1927

The Health Boards Enactment, No. 13 of 1926, came into force from the 1st of January, 1927.

## VITAL STATISTICS.

24. Populations are estimated from the Census figures which are believed to be correct. Immigration and emigration have a greater influence on population than have births and deaths. Accurate information concerning immigration and emigration especially by rail are not available and tables cannot be given.

25. Increase in population is calculated on the arithmetical increase basis as experience has shown this to be more reliable than that based on geometrical grounds.

26. Births and deaths figures are obtained from notifications compulsory under the Registration of Births and Deaths Enactment which is everywhere in force. The total number of births and deaths is approximately correct. The accuracy of diagnoses as to causes of deaths is in the majority of cases open to question, for few of the cases were seen by a qualified medical man previous to decease. In each of the four large towns every uncertified body is viewed by the Assistant Health Officer who interrogates the friends and forms a diagnosis. In rural districts these duties are carried out by the Police.

27. Deaths in towns are debited against the town only if the deceased was resident there for three months or more previous to death. The towns contain hospitals which cater both for the town and the district surrounding it. It is a well-known fact that chronic cases from the rural areas drift to the towns in the hope of getting more skilled treatment. Taking all things into consideration even with a qualifying period of three months, a number of deaths are debited against the towns which should be debited against the rural areas where the disease was contracted.

28. The general death-rate for the four States was 32.11 per mille as against 29.22 for the whole of the Federated Malay States (Pahang excluded) for 1926, this increase is probably due to malaria and the increased immigration not reckoned in the population.

29. The number of deaths attributable to fevers (most of them probably malaria) was 20,736 or 42.91 per cent. of the total. Last year the percentage was 43.

30. Dysentery and diarrhoea accounted for 7.15 per cent. of the total deaths, pulmonary tuberculosis for 4.16 per cent., pneumonia for 6.66 per cent. and convulsions for 11.08 per cent.

31. The following figures are put up for comparison: 1911 being the year the Health Branch was formed.

Year.	Federal.		Kuala Lumpur Town.		Estates.	
	General death-rate.	Fevers death-rate.	General death-rate.	Fevers death-rate.	General death-rate.	Fevers death-rate.
1911 ...	39.11	17.47	39.02	9.87	62.90	Not known
1927 ...	32.11	13.78	23.47	4.89	17.48	6.71

Few Asiatic-owned estates—especially the smaller ones—will admit the existence of sickness or the occurrence of a death, and nil returns are sent to the Health Officer, this tends to prevent these figures being as accurate as we would wish.

## VITAL STATISTICS (FEDERAL).

## POPULATION.

32. The population of the Federated Malay States as estimated at the end of June, 1927, was 1,504,823 distributed as follows:

Perak	...	...	...	...	...	...	...	664,680
Selangor	...	...	...	...	...	...	...	467,868
Negri Sembilan	...	...	...	...	...	...	...	209,113
Pahang	...	...	...	...	...	...	...	163,162

33. Assuming that the races remain in the same proportion as in the Census year, the race distribution is as follows:

State.	Europeans and Americans.	Eurasians.	Malays and other natives of the Archipelago.	Chinese.	Indians.	Others.
Perak	2,454	1,051	264,187	229,199	165,815	1,974
Selangor	3,166	1,809	108,559	183,049	169,094	2,191
Negri Sembilan	1,201	553	82,587	80,376	43,289	1,107
Pahang	367	138	111,726	40,235	9,990	706
Total	7,188	3,551	567,059	532,859	388,188	5,978

## BIRTHS.

34. Forty-eight thousand and thirteen births were registered during the year, giving a birth-rate of 31.91 per mille of population as against 39,834 births and a birth-rate of 30.28 in 1926.

The following table shows the number of births and birth-rates according to races:

Race.	No. of births.	Birth-rate.
Europeans and Americans	119	16.56
Eurasians	106	29.85
Malays and other races of the Archipelago	20,814	36.71
Chinese	16,652	31.25
Indians	10,244	26.39
Others	78	13.05

## DEATHS.

35. Forty-eight thousand three hundred and twenty-three deaths were registered, giving a death-rate of 32.11 per mille. The number of deaths in 1926 was 38,445 and the rate was 29.22.

The distribution of deaths among the several races was as follows:

Race.	No. of deaths.	Death-rate.
Europeans and Americans	35	4.87
Eurasians	53	14.93
Malays and other races of the Archipelago	15,283	26.95
Chinese	18,506	34.73
Indians	14,372	37.02
Others	74	12.38

36. The deaths and death-rates for the total population for the last ten years were as follows:

Year.	Population.	Deaths.	Rate per mille.
*1918	1,279,859	67,639	52.85
1919	1,315,700	38,645	29.37
1920	1,351,541	43,705	32.34
1921	1,304,825	38,077	29.18
1922	1,360,876	35,028	25.74
1923	1,389,667	33,914	24.40
1924	1,418,455	33,585	23.68
1925	1,447,243	34,153	23.60
1926	1,315,606†	38,445†	29.22†
1927	1,504,823	48,323	32.11

\* High figure due to influenza epidemic.

† Excluding Pahang.



37. Table showing causes of deaths in 1927.

Diseases.					No. of deaths.		Rate per mille.	
Malaria	...	...	...	...	20,736	...	13.78	
Dysentery and diarrhoea	...	...	...	...	3,454	...	2.30	
Pneumonia	...	...	...	...	3,219	...	2.14	
Pulmonary tuberculosis	...	...	...	...	2,011	...	1.34	
Ankylostomiasis	...	...	...	...	216	...	.14	
Beri-beri	...	...	...	...	1,057	...	.70	
Syphilis	...	...	...	...	84	...	.06	
Enteric (typhoid)	...	...	...	...	43	...	.03	
Tetanus	...	...	...	...	49	...	.03	
Convulsions	...	...	...	...	5,354	...	3.56	
Bright's disease	...	...	...	...	244	...	.16	
Ptomaine poisoning	...	...	...	...	164	...	.11	
Influenza	...	...	...	...	79	...	.05	
Smallpox	...	...	...	...	24	...	.02	
Plague	...	...	...	...	30	...	.02	
Cancer (including sarcoma)	...	...	...	...	43	...	.03	
Cholera	...	...	...	...	74	...	.05	
Cerebro-spinal meningitis	...	...	...	...	10	...	.01	
Diphtheria	...	...	...	...	17	...	.01	
Blackwater fever	...	...	...	...	21	...	.01	
Other diseases	...	...	...	...	11,394	...	7.57	

38. The following table shows the deaths and death-rates from the principal diseases for the last ten years:

Year.		Malaria.		Dysentery and diarrhoea.		Pulmonary tuberculosis.		Beri-beri.	
		Deaths.	Rate.	Deaths.	Rate.	Deaths.	Rate.	Deaths.	Rate.
* 1918	...	31,515	24.62	4,280	3.34	3,184	2.48	1,277	0.98
1919	...	16,975	12.90	3,712	2.82	2,445	1.86	930	0.71
1920	...	20,595	15.24	3,804	2.81	2,634	1.95	431	0.32
1921	...	17,168	13.16	2,999	2.30	2,255	1.73	422	0.32
1922	...	15,570	11.44	2,419	1.78	2,393	1.76	443	0.33
1923	...	15,516	11.17	2,142	1.55	1,934	1.39	378	0.27
1924	...	14,283	10.07	1,961	1.38	1,916	1.35	453	0.32
1925	...	14,377	9.93	1,945	1.34	2,001	1.38	424	0.29
† 1926	...	16,531	12.57	2,744	2.09	1,873	1.42	314	0.24
1927	...	20,736	13.78	3,454	2.30	2,011	1.34	1,057	0.70

\* Influenza epidemic year.

† Excluding Pahang.

39.—

VITAL STATISTICS (*State figures for comparison*).*Birth Table.*

State.		No. of birth.		1927 birth-rate per 1,000 living.		1926 birth-rate.	
Perak	...	...	20,333	...	30.59	...	30.72
Selangor	...	...	15,892	...	33.97	...	30.44
Negri Sembilan	...	...	6,306	...	30.16	...	28.52
Pahang	...	...	5,482	...	33.60	...	No figures

40. Birth statistics of different nationalities.

State.				Europeans and Americans.		Eurasians.		Malays and other races of the Archipelago.		Chinese.		Indians.		Others.	
				Births.	Birth-rate.	Births.	Birth-rate.	Births.	Birth-rate.	Births.	Birth-rate.	Births.	Birth-rate.	Births.	Birth-rate.
Perak	...	...	...	48	19.56	27	25.69	9,132	34.57	7,102	30.99	3,976	23.98	48	24.32
Selangor	...	...	...	65	20.53	50	27.64	4,273	39.36	6,545	35.76	4,939	29.21	20	9.13
Negri Sembilan	...	...	...	5	4.16	27	48.82	3,422	41.44	1,807	22.48	1,036	23.93	9	8.13
Pahang	...	...	...	1	2.72	2	14.49	3,987	35.69	1,198	29.78	293	29.33	1	1.42

41.—  
DEATH TABLE (State figures for comparison).

State.				No. of deaths.		Death-rate 1927.		Death-rate 1926.	
Perak	...	...	...	19,738	...	29.70	...	28.29	...
Selangor	...	...	...	14,117	...	30.17	...	29.29	...
Negri Sembilan	...	...	...	7,400	...	35.39	...	32.06	...
Pahang	...	...	...	7,068	...	43.32	...	No figures	...

42. Deaths and death-rate of different nationalities.

State.				Europeans and Americans.		Eurasians.		Malays and other races of the Archipelago.		Chinese.		Indians.		Others.	
				Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.	Deaths.	Death-rate.
Perak	...	...	...	15	6.11	20	19.03	5,842	22.11	8,394	36.62	5,424	32.71	43	21.78
Selangor	...	...	...	13	4.11	19	10.50	2,361	21.75	5,945	32.48	5,771	34.13	8	3.65
Negri Sembilan	...	...	...	6	5.00	11	19.89	2,436	29.50	2,480	30.85	2,459	56.80	8	7.23
Pahang	...	...	...	1	2.72	3	21.74	4,644	41.57	1,687	41.93	718	71.87	15	21.25

43. Table showing deaths and death-rates from principal diseases.

State.				Malaria.			Dysentery and diarrhoea.			Pulmonary tuberculosis.			Beri-beri.		
				Deaths.	Rate.		Deaths.	Rate.		Deaths.	Rate.		Deaths.	Rate.	
					1927.	1926.		1927.	1926.		1927.	1926.		1927.	1926.
Perak	...	...	...	9,050	13.62	13.35	1,086	1.63	1.57	912	1.37	1.52	236	0.35	0.17
Selangor	...	...	...	4,994	10.67	10.96	1,218	2.60	2.65	613	1.31	1.14	254	0.54	0.31
Negri Sembilan	...	...	...	3,048	14.58	13.65	646	3.09	2.48	338	1.62	1.74	143	0.68	0.32
Pahang	...	...	...	3,644	22.33	—	504	3.09	—	148	0.92	—	424	2.59	—

NOTE.—Figures for 1926 for Pahang not available.

INFANTILE MORTALITY.

44. There were 9,752 deaths of children under one year of age. The infantile mortality rate or rate per 1,000 births was 203.11; the rate for 1926 was 193.75.

Infantile Mortality Table.

State.				Deaths of children under one year of age.		Death-rate per 1,000 births.	
Perak	...	...	...	3,687	...	181.33	...
Selangor	...	...	...	3,018	...	189.91	...
Negri Sembilan	...	...	...	1,448	...	229.62	...
Pahang	...	...	...	1,599	...	291.68	...



## 45. Deaths from zymotic diseases.

State.	Plague.	Cholera.	Smallpox.	Cerebro-spinal meningitis.
Perak ... ..	30	74	—	2
Selangor ... ..	—	—	4	3
Negri Sembilan ... ..	—	—	20	3
Pahang ... ..	—	—	—	2

## 46. Death-rates from principal diseases for the last seven years.

Year.	Perak.			Selangor.			Negri Sembilan.			Pahang.		
	Malaria.	Dysentery and diarrhoea.	Pulmonary tuberculosis.	Malaria.	Dysentery and diarrhoea.	Pulmonary tuberculosis.	Malaria.	Dysentery and diarrhoea.	Pulmonary tuberculosis.	Malaria.	Dysentery and diarrhoea.	Pulmonary tuberculosis.
1921 ... ..	13.32	1.54	1.78	11.80	3.29	1.85	13.07	3.42	1.68	16.61	1.19	1.18
1922 ... ..	12.29	1.42	1.83	9.96	2.39	2.00	11.51	2.40	1.69	12.10	0.74	0.84
1923 ... ..	12.46	1.26	1.52	9.48	1.93	1.48	10.53	1.45	1.41	11.36	1.73	0.58
1924 ... ..	10.66	1.20	1.50	7.40	1.67	1.36	10.50	1.32	1.52	14.59	1.41	0.50
1925 ... ..	11.11	1.16	1.49	8.07	1.65	1.20	8.74	1.25	1.65	11.91	1.35	1.13
1926 ... ..	13.35	1.57	1.52	10.96	2.65	1.14	13.65	2.48	1.74	—	—	—
1927 ... ..	13.62	1.63	1.37	10.67	2.60	1.31	14.58	3.09	1.62	22.33	3.09	0.92

## 47. Vital statistics for the four large towns, Kuala Lumpur, Ipoh, Taiping and Seremban.

Town.	Estimated population.	Births.		Deaths of persons who previous to decease had resided in town three months.	
		Number.	Rate per mille.	Number.	Rate per mille.
Kuala Lumpur ... ..	101,497	4,840	47.69	2,380	23.47
Ipoh ... ..	44,910	1,650	36.74	645	14.36
Taiping ... ..	22,093	1,119	50.65	1,011	45.76
Seremban ... ..	22,666	740	32.65	582	25.68

## 48. Table showing corrected death-rates in the four principal towns during the last seven years.

Year.	Kuala Lumpur.		Ipoh.		Seremban.		Taiping.	
	Population.	Death-rate.	Population.	Death-rate.	Population.	Death-rate.	Population.	Death-rate.
1921 ... ..	81,197	27.02	37,194	20.38	17,479	36.16	21,178	50.05
1922 ... ..	84,476	21.36	38,895	21.78	13,398	27.93	21,296	35.08
1923 ... ..	88,009	19.19	40,399	20.12	19,210	24.78	21,462	33.45
1924 ... ..	91,381	16.74	41,047	13.89	20,074	17.34	21,616	33.91
1925 ... ..	94,753	15.31	42,334	13.98	20,938	17.77	21,780	29.11
1926 ... ..	98,125	21.01	43,662	13.28	21,838	24.41	21,936	34.55
1927 ... ..	101,497	23.47	44,910	14.36	22,666	25.68	22,093	45.76

## 49. Table showing corrected deaths and death-rates from principal diseases:

Town.	Malaria.		Dysentery and diarrhoea.		Pulmonary tuberculosis.		Beri-beri.	
	Deaths.	Rate.	Deaths.	Rate.	Deaths.	Rate.	Deaths.	Rate.
Kuala Lumpur ... ..	496	4.89	246	2.42	166	1.64	36	0.35
Ipoh ... ..	109	2.43	48	1.07	56	1.25	4	0.09
Taiping ... ..	106	4.80	167	7.56	70	3.17	9	0.41
Seremban ... ..	128	5.65	91	4.01	56	2.47	12	0.53

## 50. Infantile mortality table:

Towns.			Births.		Death under one year.		Rate per 1,000 births.	
Kuala Lumpur	...	...	...	4,840	...	507	...	104.75
Ipoh	...	...	...	1,650	...	140	...	84.85
Taiping	...	...	...	1,119	...	160	...	142.98
Seremban	...	...	...	740	...	109	...	147.30

51. Table showing corrected death-rates from principal diseases in the four towns for the last seven years.

Year.			Kuala Lumpur.			Ipoh.			Seremban.			Taiping.		
			Malaria.	Dysentery and diarrhoea.	Pulmonary tuberculosis.	Malaria.	Dysentery and diarrhoea.	Pulmonary tuberculosis.	Malaria.	Dysentery and diarrhoea.	Pulmonary tuberculosis.	Malaria.	Dysentery and diarrhoea.	Pulmonary tuberculosis.
1921	...	...	5.25	3.63	3.22	11.24	2.39	4.54	11.76	16.71	6.23	25.06	6.06	3.95
1922	...	...	2.79	2.18	3.33	4.50	1.62	2.54	10.44	5.92	6.35	5.45	1.50	1.74
1923	...	...	2.06	1.77	2.91	1.48	1.34	3.61	2.86	3.18	2.45	6.94	2.84	3.73
1924	...	...	1.13	1.53	2.66	0.97	1.00	1.51	2.89	1.54	1.89	5.41	2.91	3.47
1925	...	...	1.46	1.14	1.75	1.77	0.66	1.51	2.58	1.62	2.72	2.85	4.40	3.81
1926	...	...	1.10	1.82	1.36	1.12	0.87	1.08	3.61	2.79	2.24	3.56	5.24	3.37
1927	...	...	4.89	2.42	1.64	2.43	1.07	1.25	5.65	4.01	2.47	4.80	7.56	3.17

## MOSQUITO-BORNE DISEASES.

52. In Malaya, these are malaria, filariasis and dengue: the first named is, alas, still too common; filariasis is rare; dengue is frequently seen but is not of grave import.

## MALARIA AND ANTI-MALARIAL MEASURES.

53. Malaria is still the chief cause of sickness and death in the Federated Malay States.

The year 1927 was like 1926, a bad malarial year; the number of deaths recorded during the year as due to fever was 20,736, giving a death-rate of 13.78 per mille population. The raising of the normal water level throughout vast tracts of the country due to the abnormal floods at the end of 1926 and early in 1927 is probably the chief cause of this increase, an increase being noted to follow a period of excessive heavy rainfall.

54. The Malaria Advisory Board, of which the Chief Health Officer is Vice-Chairman, met regularly during the year and its minutes were published in the Press.

55. The Mosquito Destruction Boards throughout the country continued their useful activities and the gospel of malaria prevention by mosquito reduction was preached as before and carried out in numerous localities.

56. Close liaison was maintained between the Health Office, Railways, and various Mosquito Destruction Boards and estates where oiling was in force up to the railway boundary, by this it was ensured that no dangerous focus was left in a protected area, the Railway Department when not doing the work themselves, arranging to pay the Board or estate concerned for oiling, etc., within the railway boundary.

57. The teaching of mosquitology, propaganda, investigations and research, anti-mosquito measures and quinine distribution were amongst the anti-malarial activities of the Health Branch.

58. Tablets of quinine to the number of 1,482,000 were distributed to the Health Officers for ultimate free distribution to the public through the District Officers, the Police, the Education Department and the Post Offices, in addition 202,877 tablets were distributed by the Railway Department through the Health Officer, Railways, to the staff on open lines and on construction works.

## MEASURES TAKEN FOR PREVENTING THE INTRODUCTION AND SPREAD OF INFECTIOUS AND CONTAGIOUS DISEASES.

## QUARANTINE AND PORT HEALTH WORK AT PORT SWETTENHAM.

59. It was possible to reorganise the Health staff at Klang during the year and on 25th March, 1927, Dr. E. R. C. Cooke, M.C., on return from leave was posted to Klang as Health Officer, Klang and Port Swettenham, his duties involving charge of the Sanitary Board areas of the towns also of the Quarantine Camp, Port Swettenham. This arrangement relieved Dr. Graham whose designation remained as Health Officer, Coast, of the above duties and left him in whole time charge of all the estates in the Coast area and the Sanitary Board areas other than Klang and Port Swettenham in the district.



60. The Quarantine Camp was severely flooded by sea water on the night of the 2nd April, owing to an exceptionally high tide and the breaking of the bund in 17 places. The water was two feet deep in the camps and five feet deep in the Chinese Decrepit Wards. In the subsequent confusion 54 coolies absconded, of whom 20 were recovered. The camp was fortunately free from cholera at the time.

61. During the year 64 ships with immigrants were boarded and inspected. The labourers were landed at the Quarantine Camp. Of the 64 ships 16 were infected—one with cholera, two with smallpox, two with cerebro-spinal meningitis, one with cerebro-spinal meningitis and chicken-pox and 10 with chicken-pox.

62. The number of immigrants who entered the Quarantine Station, Port Swettenham, was 80,399 and the number remaining on the 31st December, 1927, was 1,697, making a total of 82,096. The largest number on any one day was 7,679 on the 14th July, 1927.

63. The following table shows how these immigrants were distributed:

Discharged to Dépôt ... ..	80,298
Transferred to Klang Hospital ... ..	61
Absconded from the Quarantine Camp ... ..	58
Died in hospital, cholera and smallpox wards ... ..	260
Remaining on 31st December, 1927 ... ..	1,419
Total ...	82,096

64. There were 260 deaths made up as follows:

Male adults ... ..	64
Female adults ... ..	37
Male minors ... ..	25
Female minors ... ..	17
Male infants ... ..	54
Female infants ... ..	63
	260

The percentage of deaths to total arrived was 0.31.

65. The daily average of immigrants in the camp was 2,241.

66. Six thousand six hundred and forty-three passengers were quarantined during the year as against 3,897 in 1926.

67. Sixty-five thousand six hundred and fifty immigrants received routine treatment for ankylostomiasis.

68. Vaccinations including re-vaccinations were performed as follows:

Immigrants ... ..	122,179
Passengers ... ..	9,187
Staff and Police ... ..	178
	131,544

69. Anti-choleraic inoculations:

Immigrants ... ..	2,245
Passengers ... ..	100
Staff, Police, Public Works Department Coolies, etc. ...	172
	2,517

70. The number of infectious diseases treated were: cholera, 23; smallpox, 10; chicken-pox, 38; measles, 60; cerebro-spinal meningitis, 8; mumps, 7.

#### CAMP HOSPITAL.

71. One hundred and four cases remained in hospital at the beginning of the year, of whom 79 were sick and 25 were dependents. Three thousand eight hundred and ninety-four cases were admitted during the year, of whom 2,814 were sick and 1,080 dependents. Of the total number treated 242 died, giving a percentage of 12.15 per cent. Most of the deaths were due to broncho-pneumonia.

## INFECTIOUS DISEASES OUTSIDE THE QUARANTINE CAMP.

72. The following table shows the cases of infectious diseases reported and the State in which they originated :

State.	Plague.		Cholera.		Smallpox.		Diphtheria.		Cerebro-spinal meningitis.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Perak ... ..	32	30	114	74	3	—	14	6	4	2
Selangor ... ..	—	—	—	—	170	4	21	5	8	3
Negri Sembilan...	—	—	—	—	63	20	14	5	4	3
Pahang ... ..	—	—	—	—	1	—	3	1	2	2
Total ... ..	32	30	114	74	237	24	52	17	18	10

## PLAGUE.

73. There were outbreaks of plague in Ipoh, Pusing, Kampar and Kampong Kepayang, detailed reports of which were submitted as each outbreak occurred. The general precautions which were taken included closing of houses or shops, complete segregation and vaccination of contacts and neighbours, disinfection of premises and clothes, daily examination of contacts and frequent inspections of the guards in order to prevent abscondings.

How the infection was introduced was not definitely established but it is thought extremely probable that infected fleas were imported with either Siamese or Indian rice. Anti-rat measures were carried out by trapping and poisoning and this is being continued. There was no rat mortality and only one rat trapped was found plague-infected.

## CHOLERA.

74. One hundred and fourteen cases of cholera occurred in Perak with 74 deaths.

There were three distinct outbreaks, the first occurring early in June on estates in the Batang Padang area of Lower Perak, and at Sitiawan. A further outbreak occurred in Perak North in July and the most serious outbreak commenced on 18th August, 1927, and lasted for three weeks, in this outbreak on the Perak River between Parit and Teluk Anson there were 57 cases and 40 deaths. Detailed reports of these outbreaks have been previously furnished; anti-cholera vaccination was carried out in as wholesale a manner as possible in the infected areas, pamphlets giving warnings and instructions printed in the vernacular were lavishly distributed. The motor launch belonging to the Medical Department at Teluk Anson proved of great value in this outbreak, as many cases occurred in the riverine kampongs.

## SMALLPOX.

75. There were 237 cases with 24 deaths; 170 with four deaths in Selangor and 63 with 20 deaths in Negri Sembilan, Perak recorded three cases and Pahang one.

In Negri Sembilan the cases occurred in March, April and May. In Selangor the Kuala Lumpur and Ulu Langat districts were chiefly affected, two epidemics occurring in May and August, but the disease was apparently of a much milder form than the earlier outbreak in Negri Sembilan. Considerable difficulty was experienced in tracing out cases and contacts and keeping them from leaving infected areas. Prosecutions were made in several cases under the Quarantine and Prevention of Disease Enactment and heavy fines were inflicted in the Courts. Leaflets, giving details of these and assuring the public that it was to their own interest to report cases early and to assist the Government, were published in various languages and distributed in great numbers. Many thousands of vaccinations or rather re-vaccinations were carried out in the areas affected and the opportunity was also taken of re-vaccinating a very considerable proportion of the total population of the country.

## DIPHTHERIA AND CEREBRO-SPINAL MENINGITIS.

76. Fifty-two cases of diphtheria with 17 deaths and eighteen cases of cerebro-spinal meningitis with 10 deaths were reported during the year, these were fairly evenly distributed throughout the four States.



## PULMONARY TUBERCULOSIS.

77. There were 2,011 deaths from pulmonary tuberculosis and the death-rate was 1.34 as against 1,873 deaths and a death-rate of 1.42 in 1926.

78. With regard to the four States, Perak had a death-rate of 1.37 as compared with 1.52 in 1926, Selangor had 1.31 as compared with 1.14, Negri Sembilan had 1.62 as compared with 1.74, Pahang had 0.92.

79. With regard to the four large towns, Kuala Lumpur had a death-rate of 1.64 as compared with 1.36 in 1926, Ipoh 1.25 as compared with 1.08, Taiping 3.17 as compared with 3.37 and Seremban 2.47 as compared with 2.24.

## HELMINTHIC DISEASES.

80. The chief one of importance from a health point of view is ankylostomiasis. At least 90 per cent. of the native population harbour the worm in small numbers, but few show symptoms unless they are also suffering from a concurrent disease such as malaria or dysentery when the combination is a grave one. Ascariasis is also very common, and though in the majority of cases is not of serious import, is sometimes responsible for acute intestinal trouble and for convulsions in children.

## SCAVENGING, NIGHT-SOIL DISPOSAL, DRAINAGE, ETC.

## COLLECTION AND DISPOSAL OF REFUSE.

81. Scavenging in most towns is fairly well done. The best disposal is by incineration; dumping or the filling of swamps is not so satisfactory. Prolonged wet weather hinders incineration and leads to accumulation of refuse, with consequent fly breeding. This danger also occurs in dumping unless very careful supervision is exercised.

## COLLECTION AND DISPOSAL OF NIGHT-SOIL.

82. No town in the Federated Malay States has a water carriage system of disposal. Some Government and some private septic tanks and other types of small installations have been built and these are being watched carefully, and the effluents examined with a view to determining the most suitable types of installation for a building or small groups of buildings, such as offices, bungalows or cooly lines.

83. The system in use in most towns is the two-bucket system for the shop-houses and the two-bucket system or pit latrines for the bungalows standing in their own compounds. Most of these pit latrines form fly-breeding grounds and they are therefore unsatisfactory. Petroleum, lime and other larvicides have been used but unless applied regularly do not prevent the breeding. The bucket system is being recommended for use on estates wherever possible in place of pit latrines.

The ultimate disposal in the bucket system is by trenching.

## DRAINAGE.

84. Street drainage is controlled by the Sanitary Board authorities. Anti-malarial drainage is controlled by the Mosquito Destruction Boards. Many miles of sub-soil piping have been done by the Anti-malaria Branch of the Public Works Department.

## CLEARANCE OF BUSH.

85. Clearance of bush is done on public lands by Sanitary Boards or Mosquito Destruction Boards. Clearance of bush in this country is not always a profitable proceeding for at the wet hill foots it promotes the propagation of *A. maculatus*, the most powerful malaria carrier in Malaya. Many a healthy area has been rendered intensely malarial by the clearance of bush, inspite of the fact that notices pointing out this danger have been published in the press and local publications.

## WATER SUPPLIES.

86. In the majority of cases towns are supplied with drinking water brought from uninhabited areas through pipes by gravitation. In some cases filters are employed, in others they have not been considered necessary. Both slow and rapid filters are in use.

87. The necessity for keeping catchment areas as free from pollution as possible has long been recognised and efforts have been made to ensure these areas being kept clear of trespassers by having them gazetted as "Forest Reserves". The water supplies of all the larger towns are examined monthly at the Institute for Medical Research, and the Kuala Lumpur water supply weekly.

88. Some estates have excellent supplies; others, especially those in the coastal areas, are not so fortunate.



## PUBLIC HEALTH EDUCATION.

89. The Public Health Education Committee met on several occasions during the year; at Horticultural Shows exhibitions were put up which were well attended, lectures were given and pamphlets which had been prepared by the Committee were distributed in large numbers in various languages.

90. Popular lectures on malaria were given in Malay and Chinese in various parts of the country, these were illustrated by lantern slides and were well attended.

91. A cinematograph film of work done at the Infant Welfare Centre, Kuala Lumpur, was also exhibited on several occasions to large and interested audiences of various nationalities.

92. The numbers of Government and State-aided schools in the Federated Malay States are as follows:

Government English Schools	...	...	...	...	...	22
Aided English Schools	...	...	...	...	...	25
Government Vernacular Schools	...	...	...	...	...	480

93. Besides the above there are a considerable number of private schools.

The duties of school inspection were shared with Medical Branch. Altogether 352 visits of inspection were made by the Health Branch.

94. Each school has a stock of Government quinine which is issued free of charge to those scholars who require it.

## MATERNITY AND CHILD WELFARE.

95. Infant Welfare Centres are established in Kuala Lumpur, Ipoh, Taiping, and Seremban. An account of the work done at each Centre is attached in a separate report.

96. Each Centre is under the charge of a Lady Medical Officer and specially trained Infant Welfare Sisters and has also a staff of Asiatic Health Visitors who work part time at the Centre and part time visiting in the district.

97. These centres do very excellent ante-natal work, and also serve as outdoor dispensaries for women and children. The numbers attending increase yearly and many patients seeking advice or treatment come from great distances.

It is noteworthy that the infantile mortality figures of the four large towns are substantially reduced this year.

## WORK UNDER THE LABOUR CODE.

98. It is the duty of the employer of labour to engage the staff necessary for the protection of health and the cure of disease amongst his employees. The Health Branch co-operates with the Labour Department with the object of securing an adequate standard of sanitation where labour is employed.

99. The total number of estates sending in returns is 1,675 and the total number of estate hospitals is 169. Each of these estates should be visited at least twice yearly by the Health Officer of the district but this unfortunately has not always been possible.

## ESTATES.

100. Details of the distribution of estates and estate hospitals and the frequency of visits by Health Officers are given below:

State.	Health district.	Estate.			Estate hospitals.		
		No.	No. of visits by H.O.		No.	No. of visits by H.O.	
			1927.	1926.		1927.	1926.
Perak ...	Perak North ...	279	198	78	24	42	15
	Kinfa ...	132	44	64	6	6	11
	Perak South ...	254	39	92	25	16	18
Selangor ...	Selangor East ...	243	120	122	23	17	19
	Selangor Coast ...	213	152	135	35	35	33
	Bernam ...	6	7	7	2	1	2
Negri Sembilan ...	All districts...	370	146	227	43	38	56
Pahang ...	Pahang West ...	84	46	...	5	16	...
	Pahang East ...	94	52	...	6	12	...
Total, F.M.S. ...		1,675	804	725	169	183	154

Supplementary visits were paid by Sanitary Inspectors.



101. The distribution of labour was as follows:

				Indians.		Others.		Total.
Perak ...	{	Perak North ...	...	27,783	...	3,576	...	31,359
		Kinta ...	...	8,482	...	1,026	...	9,508
		Lower Perak and Batang Padang ...	...	27,372	...	2,965	...	30,337
Selangor ...	{	Selangor East ...	...	23,529	...	3,473	...	27,002
		„ Coast ...	...	48,456	...	904	...	49,360
		Bernam ...	...	2,442	...	26	...	2,468
Negri Sembilan		All districts ...	...	28,037	...	17,346	...	45,383
Pahang ...	{	Pahang West ...	...	4,446	...	3,975	...	8,421
		„ East ...	...	462	...	3,216	...	3,678
Total, F.M.S. ...				171,009	...	36,507	...	207,516

102. The table below sets out the mortality rates among estate labourers during the past seventeen years, that is, since the Health Branch took over the supervision of health conditions on estates:

Year.	Total number of estate labourers.			Deaths.	Death-rate per mille.		
1911	...	...	143,614	9,040	...	62.9	
1912	...	...	171,968	7,054	...	41.02	
1913	...	...	182,937	5,592	...	29.6	
1914	...	...	176,226	4,635	...	26.3	
1915	...	...	169,100	2,839	...	16.78	
1916	...	...	187,030	3,299	...	17.61	
1917	...	...	214,972	3,906	...	18.71	
*1918	...	...	213,425	9,081	...	42.55	
1919	...	...	216,573	3,384	...	15.16	
1920	...	...	235,156	4,367	...	18.57	
1921	...	...	175,649	3,195	...	18.19	
1922	...	...	159,279	2,556	...	16.05	
1923	...	...	147,276	1,924	...	13.06	
1924	...	...	144,902	1,514	...	10.45	
1925	...	...	146,558	1,585	...	10.81	
†1926	...	...	181,204	2,632	...	14.53	
1927	...	...	207,086	3,619	...	17.48	

\* Influenza year.

† Excluding Pahang.

103. There were 2,982 deaths among the Indian estate labourers during the year, giving a mortality rate of 17.44 per mille as against 2,342 deaths and a death-rate of 15.18 per mille in 1926.

104. Return of malaria admissions and deaths of Indian labourers and others in estates and Government hospitals.

Divisions.	Malaria admissions to estates and Govt. hospitals.	Malaria deaths in estates and Govt. hospitals.	Total admissions to estates and Govt. hospitals.	Total labourers employed, all nationalities.	Total deaths.	Death-rate per mille.	Indians employed.	Deaths, Indian labour force.	Death-rate, Indian labour force.	Number of estates.	Number of estate hospitals.
Perak North ...	5,461	186	15,712	31,359	483	15.40	27,783	458	16.48	279	24
Kinta ...	1,883	73	4,461	9,508	118	12.41	8,482	116	13.68	132	6
Lower Perak and Batang Padang	4,723	144	14,562	30,337	289	9.53	27,372	286	10.45	254	25
Selangor East ...	6,845	188	18,168	27,002	484	17.92	23,529	469	19.93	243	23
Selangor Coast ...	5,887	191	18,141	49,360	586	11.87	48,456	585	12.07	213	35
Sabak Bernam ...	125	11	959	2,468	28	11.34	2,442	28	11.46	6	2
Negri Sembilan	12,859	499	22,950	45,383	1,046	23.05	28,037	842	30.03	370	43
Pahang West ...	2,139	79	5,438	8,085	390	48.24	4,412	188	42.61	84	5
Pahang East	1,536	20	5,468	3,584	195	47.17	462	10	21.65	94	6
Total ...	41,458	1,391	105,859	207,086	3,619	17.48	170,975	2,982	17.44	1,675	169

## MINES.

105. The average population engaged in mining during the year was 122,888 as against 110,293 in 1926 or an increase of 12,595, due probably to the high price of tin.

Mines are not required to send in sickness and death returns and the sick-rates and death-rates are not known.

## GENERAL.

## CHINESE DECREPIT CAMP.

106. The Chinese Decrepit Camp at Port Swettenham was administered during the year by the Health Branch. No new admissions were allowed during the year to this temporary camp, but there were 38 re-admissions from Klang Hospital.

107. The previous admissions, etc., from various States are shewn in the following table:

State.	Remained on 1-1-27.	Admitted.	Total.	Discharged.	Transferred.	Absconded.	Died.	Remaining.
Perak ... ..	121	19	140	1	17	...	22	100
Selangor ... ..	73	13	86	1	13	4	10	58
Negri Sembilan ...	35	6	41	...	6	2	5	28
Pahang ... ..								
Total ...	229	38	267	2	36	6	37	186

108. There were 37 deaths during the year and the cause of death was chiefly general debility.

Percentage of deaths to total treated was 13.48.

109. About 30 per cent. of the inmates were engaged in the manufacturing of all sorts of bamboo, baskets, coir brooms, toys, etc., and earned from 10 to 20 cents per day, with which they generally buy some extras, such as, tobacco, etc., for themselves. The workshop is a very useful institution and kept many of them occupied and helped them to pass the time. Many kindly gifts for the inmates were received from the Chinese community.

110. The Health Boards Enactment came into force on January 1, 1927. An Administrator was appointed, meetings of the Central Board were held in Kuala Lumpur, various Local Board meetings throughout the country, and good progress was made in getting the machinery of this Enactment into working order.

111. As recorded in my last report there were unprecedented floods in Pahang at the end of 1926. These broke down the road communication across the State, so from February 1st, the State of Pahang was divided into two for purposes of health control, and an officer was sent by sea to Kuantan to take over the districts of Kuantan and Pekan; being designated Health Officer, Pahang East, the Health Officer whose head-quarters are at Kuala Lipis being designated Health Officer, Pahang West.

112. The flooding of Kuala Lipis and other towns in Pahang, and Kuala Kangsar in Perak caused considerable anxiety to the Health Branch, but the clearing away of the mud and rubbish deposited by the waters and the prompt employment of general sanitary measures successfully prevented any outbreak of disease.

113. This department has endeavoured to keep in close liaison with the Public Works Department as regards new works and undertakings where large numbers of coolies are employed, and efforts are made to ensure that as far as possible the labourers are housed in a "sanitary area" where anti-malarial measures are being taken, and that they are provided with a potable water supply and a satisfactory system of latrines.



114. The work on the road to Cameron's Plateau (4,750 ft.) is let out on contract and several hundreds of coolies, mostly Chinese, are employed on various sections. Anti-malarial measures are in force right along the road where the coolies are housed, and two Health Inspectors are stationed on the road some miles apart; these Inspectors supervise the anti-malarial measures and the general sanitation of the surroundings of the living quarters of the labour force.

115. A large labour force is employed by the Company building the dam at Chendroh on the Perak River, and periodical visits are paid to the Camp by officers of this department.

116. The increase in the number of deaths from beri-beri as shown in para. 38 was largely due to the cases which occurred in Pahang among the Railway construction coolies.

This was consequent to the destruction of the vegetable gardens by the floods, the labourers being thereby deprived of green vegetables grown locally; and importation of vegetable and other food-stuffs, etc., was rendered very difficult for a time owing to the upset of transport facilities. Extract of rice polishings and marmite were supplied and stocks of these are now kept in Construction Hospitals in view of future similar emergencies.

117. The year under review has been a difficult one for this department, which while not being up to strength, had in addition to a vast amount of routine inspection and other works, to deal with what were—for this country—severe outbreaks of cholera, smallpox and plague.

These necessitated the moving about of Health Officers and Inspectors from their own districts to areas where extra help was urgently needed, and I would like to thank all my staff for their loyal work and co-operation during the year, and especially during the periods of these outbreaks.

KUALA LUMPUR,  
3rd March, 1928.

A. K. COSGRAVE,  
Acting Chief Health Officer, F.M.S.

## APPENDIX E.

REPORT OF THE REGISTRAR-GENERAL OF BIRTHS AND DEATHS,  
FEDERATED MALAY STATES, FOR THE YEAR 1927.

The records of births and deaths indicate that the registration of births and deaths in each of the four States is up to date.

2. Arrangements were made to have the registers which were lost in the Pahang floods rewritten from the original certificates which had been received in this office prior to the flood.

3. The leaves forming the original registers of births and deaths which were received were bound in the office.

4. I attach a schedule of vital statistics.

KUALA LUMPUR,  
2nd March, 1928.

A. K. COSGRAVE,  
*Registrar-General of Births and Deaths,  
Federated Malay States.*

## FEDERATED MALAY STATES.

ESTIMATED POPULATION OF ALL RACES OF EACH STATE AND FOR THE WHOLE  
OF THE FEDERATED MALAY STATES FOR 1927.

State.	Europeans and Americans.	Eurasians.	Malays and other races of the Archipelago.	Chinese.	Indians.	Others.	Total.
Perak ... ..	2,454	1,051	264,187	229,199	165,815	1,974	664,630
Selangor ... ..	3,166	1,809	108,559	183,049	169,094	2,191	467,868
Negri Sembilan ...	1,201	553	82,587	80,376	43,289	1,107	209,113
Pahang ... ..	367	138	111,726	40,235	9,990	706	163,162
Total, F.M.S. ...	7,188	3,551	567,059	532,859	388,188	5,978	1,504,823

## SUMMARY OF BIRTHS AND DEATHS FOR THE YEAR 1927.

## BIRTHS.

State.	Europeans and Americans.	Eurasians.	Malays and other natives of the Archi- pelago.	Chinese.	Indians.	Others.	Total.	Rate per mille of popula- tion.
Perak ... ..	48	27	9,132	7,102	3,976	48	20,333	30.59
Selangor ... ..	65	50	4,273	6,545	4,939	20	15,892	33.97
Negri Sembilan ...	5	27	3,422	1,807	1,036	9	6,306	30.16
Pahang ... ..	1	2	3,987	1,198	293	1	5,482	33.60
Total, F.M.S.	119	106	20,814	16,652	10,244	78	48,013	31.91

## DEATHS.

Perak ... ..	15	20	5,842	8,394	5,424	43	19,738	29.70
Selangor ... ..	13	19	2,361	5,945	5,771	8	14,117	30.17
Negri Sembilan ...	6	11	2,436	2,480	2,459	8	7,400	35.39
Pahang ... ..	1	3	4,644	1,687	718	15	7,068	43.32
Total, F.M.S.	35	53	15,283	18,506	14,372	74	48,323	32.11



# FEDERATED MALAY STATES.

## RETURN OF DEATHS OF ALL AGES FROM PRINCIPAL DISEASES FOR 1927.

State.	Plague.	Cholera.	Smallpox.	Cerebro-spinal meningitis.	Diphtheria.	Typhus.	Yellow fever.	Malaria (including fever).	Blackwater fever.	Dysentery and diarrhoea.	Phthisis (pulmonary tuberculosis).	Pneumonia.	Beri-beri.	Enteric (typhoid).	Syphilis.	Ankylostomiasis.	Tetanus.	Cancer (including Sarcoma).	Bright's disease.	Influenza.	Potomaline poisoning.	Convulsions.	Deaths from other diseases.	Children under one year.	Persons between 20-40.	Persons over 60.	Persons of other ages.	Total No. of deaths.
Perak	30	74	...	2	6	...	...	9,050	6	1,086	912	953	236	15	37	78	30	12	44	46	33	1,944	5,144	3,687	5,223	2,548	8,280	19,738
Selangor	...	...	4	3	5	...	...	4,994	7	1,218	613	1,445	254	19	28	91	8	17	50	17	126	1,841	3,374	3,018	4,298	1,091	5,710	14,117
Negri Sembilan	...	...	20	3	5	...	...	3,048	4	646	338	582	143	7	16	33	7	13	140	13	5	887	1,490	1,448	2,332	648	2,972	7,400
Pahang	...	...	...	2	1	...	...	3,644	4	504	148	239	424	2	3	14	4	1	10	3	...	682	1,383	1,599	1,760	772	2,937	7,068
Total, F.M.S.	30	74	24	10	17	...	...	20,736	21	3,454	2,011	3,219	1,057	43	84	216	49	43	244	79	164	5,354	11,391	9,752	13,613	5,059	19,899	48,323

## APPENDIX F.

ANNUAL REPORT OF THE SURGICAL DEPARTMENT, IPOH HOSPITAL,  
FOR 1927.

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Major operations total	...	...	...	...	...	...	...	299
Total deaths following major operations	...	...	...	...	...	...	...	40
Percentage	...	...	...	...	...	...	...	13.38
Emergency operations	...	...	...	...	...	...	...	123
Deaths (emergency operations)	...	...	...	...	...	...	...	33
Percentage	...	...	...	...	...	...	...	26.83
Interval operations	...	...	...	...	...	...	...	176
Deaths (interval operations)	...	...	...	...	...	...	...	7
Percentage	...	...	...	...	...	...	...	3.98
Minor operations total	...	...	...	...	...	...	...	886
Total surgical admissions	...	...	...	...	...	...	...	2,700

Dr. C. B. Pasley, F.R.C.S.I., was in surgical charge till December 23rd, when he was relieved by Dr. T. W. H. Burne, M.B., B.S.

IPOH,  
26th January, 1928.

T. W. H. BURNE,  
Chief Surgeon, Perak.

## REGIONAL CLASSIFICATION OF MAJOR SURGICAL OPERATIONS FOR 1927.

I. *Head and Neck.*—

Decompression operation—compound fracture of skull	...	...	...	...	...	...	...	3
Skin grafting head	...	...	...	...	...	...	...	2
Mastoiditis (Heath's and Schwartz)	...	...	...	...	...	...	...	15
Mastoid abscess	...	...	...	...	...	...	...	1
Opening and curetting of thyroglossal cyst	...	...	...	...	...	...	...	1
Drainage (trephine) suppurative maxillary antrum	...	...	...	...	...	...	...	2
Opening and curetting tumour (Dermoid cyst) temporal region	...	...	...	...	...	...	...	1
Removal—foreign body—neck	...	...	...	...	...	...	...	1
Plastic operation—hare lip	...	...	...	...	...	...	...	5
Excision of tumour—Hodgkin's disease—cervical glands	...	...	...	...	...	...	...	1
„ epulis of upper jaw with extraction of teeth	...	...	...	...	...	...	...	1
„ dermoid cyst—neck	...	...	...	...	...	...	...	1
„ lower jaw—partial—for epithelioma	...	...	...	...	...	...	...	1
„ cervical glands	...	...	...	...	...	...	...	1
„ suppurating lymphadenitis	...	...	...	...	...	...	...	1
„ dermoid cyst (vault of skull)	...	...	...	...	...	...	...	1
„ keloids—both ears	...	...	...	...	...	...	...	1

II. *Upper Limbs.*—

Amputation of arm	...	...	...	...	...	...	...	2
„ hand	...	...	...	...	...	...	...	1
Disarticulation of thumb	...	...	...	...	...	...	...	2
„ fingers	...	...	...	...	...	...	...	4
Excision of elbow joint	...	...	...	...	...	...	...	1
„ lipoma	...	...	...	...	...	...	...	3
Setting compound communitied fracture of humerus with laceration of deltoid	...	...	...	...	...	...	...	1
Malunited fracture of left humerus	...	...	...	...	...	...	...	1
Sequestrectomy (arm)	...	...	...	...	...	...	...	2
Suturing flexor tendons of hand	...	...	...	...	...	...	...	1
Setting of complete backward dislocation of right thumb due to old burn scar	...	...	...	...	...	...	...	1
Removal of foreign bodies (stones) from muscles of hand and forearm	...	...	...	...	...	...	...	1



*Lower Limbs.—*

Skin grafting—leg	...	...	...	...	...	...	1
Femoral periarterial sympathectomy	...	...	...	...	...	...	1
Excision of tumour of buttock (sarcoma)	...	...	...	...	...	...	1
„ sebaceous cyst—buttock	...	...	...	...	...	...	2
„ femoral aneurism	...	...	...	...	...	...	1
Disarticulation (toes)	...	...	...	...	...	...	6
Amputation (leg)	...	...	...	...	...	...	5
„ (thigh)	...	...	...	...	...	...	1
Arthrotomy with closure (knee)	...	...	...	...	...	...	2
„ subsequent drainage (knee)	...	...	...	...	...	...	2
Plating tibia—(compound fracture)	...	...	...	...	...	...	1
Wiring fractured patella	...	...	...	...	...	...	1
Opening and curetting of suppurative osteoperiostitis—left femur	...	...	...	...	...	...	1
Ligaturing of posterior tibial artery	...	...	...	...	...	...	1
„ varicose veins (leg)	...	...	...	...	...	...	1
„ of femoral artery—popliteal aneurism	...	...	...	...	...	...	1
Sequestrectomy (femur)	...	...	...	...	...	...	1

*Thorax.—*

Excision of fibroadenoma of right breast	...	...	...	...	...	...	1
„ carbuncle	...	...	...	...	...	...	1
Resection of rib	...	...	...	...	...	...	3
„ „ and draining of subphrenic abscess	...	...	...	...	...	...	1

*Abdomen and pelvis.—*

Exploratomy laparotomy	...	...	...	...	...	...	3
Laparotomy—exploratory—stricture vagina with haematocolpos and haematometra	...	...	...	...	...	...	1
Laparotomy—exploratomy—traumatic haematoma of right broad ligament	...	...	...	...	...	...	1
Laparotomy and suturing of perforated gut (traumatic)	...	...	...	...	...	...	1
„ „ „ (enteric)	...	...	...	...	...	...	1
„ „ stab wound gut	...	...	...	...	...	...	1
Laparotomy—resection and anastomosis of gut—traumatic rupture—general peritonitis	...	...	...	...	...	...	1
Laparotomy—resection and anastomosis of gut—intestinal obstruction	...	...	...	...	...	...	1
Laparotomy—resection gut traumatic rupture—railway accident	...	...	...	...	...	...	1
„ closure—perforated gastric ulcer	...	...	...	...	...	...	4
„ suturing—stab wounds of stomach and intestines	...	...	...	...	...	...	1
„ „ „ liver, stomach and intestines	...	...	...	...	...	...	1
Laparotomy—suturing—stab wound of liver and diaphragm	...	...	...	...	...	...	1
„ suturing—stab wound of liver	...	...	...	...	...	...	1
„ ruptured liver—revolver shot wound	...	...	...	...	...	...	1
„ stab wound—abdomen	...	...	...	...	...	...	3
„ „ chest	...	...	...	...	...	...	1
„ for perforated gangrenous gut in strangulated hernia	...	...	...	...	...	...	1
„ draining perforated common bile duct	...	...	...	...	...	...	1
„ general peritonitis	...	...	...	...	...	...	6
„ „ with acute appendix	...	...	...	...	...	...	3
„ general peritonitis with liver abscess	...	...	...	...	...	...	1
„ drainage—pelvic peritonitis	...	...	...	...	...	...	1
„ „ liver abscess	...	...	...	...	...	...	1
„ appendicitis—subacute	...	...	...	...	...	...	1
„ appendix abscess	...	...	...	...	...	...	4
„ pancreatitis	...	...	...	...	...	...	1
„ perigastritis (adhesions)	...	...	...	...	...	...	1
„ vesicular mole and gastric ulcer	...	...	...	...	...	...	1
„ tubercular enteritis	...	...	...	...	...	...	1
„ cirrhosis liver	...	...	...	...	...	...	1
„ perihepatitis (adhesions)	...	...	...	...	...	...	1

Laparotomy—cancer stomach	1
„ aortic aneurism	1
„ splenic cyst with complete transposition of viscera	1
„ round celled sarcoma of ovary—inoperable	1
„ drainage—ovarian cyst	2
„ excision of intussusception	1
„ reduction of intussusception and removal of polypus of ileum	1
„ reduction of ileo—coecal intussusception with appendicectomy	2
Appendicectomy	19
Posterior gastro jejunostomy	10
Anterior gastrotomy (for needles in stomach)	1
Splenectomy and suture of liver—motor car accident	1
„ haemorrhagic cyst of spleen	1
Cholecystostomy	3
„ with extraction of gall stones	2
Repair abdominal wall	1
Nephrectomy—stab wound of kidney	1
Drainage—subphrenic abscess	1
„ deep seated abscess iliac region	1
Excision of abdominal sinus (pyosalpinx)	1
„ sarcoma—abdominal wall	1
„ pyosalpinx right and hydrosalpinx left	1
„ pyosalpinx	1
„ fibroma (uterus)	1
„ hydrosalpinx—left	1
„ ruptured tubal pregnancy	2
„ ectopic gestation—tubal	1
Ventral suspension—uterus (one Kelly and one Gilliam)	2
Anterio vesicopexy	1
Caesarian section (full term pregnancy with carcinoma of cervix)	1
Hysterectomy—total—carcinoma of cervix	1
Supra vaginal hysterectomy—fibroid uterus	1
„ „ with excision of ovarian cyst	1
Excision of suppurating inguinal glands	1
Excision of omentum (gangrenous) and draining abdomen through inguinal canal in strangulated hernia and general peritonitis	1
Inguinal herniotomy—reducible	30
„ irreducible	1
„ obstructed	2
„ strangulated hernia	3
„ strangulated hernia with resection of gut	1
Suprapubic lithotomy	7
„ cystostomy	2
Ligaturing of right external iliac artery for femoral aneurism	1
„ internal iliac artery and excision of aneurism of obturator artery	1
<i>Perineum.—</i>	
Excision of haematocele of cord and hydrocele of sac	1
Operation for hydrocele of cord	1
„ „ tunica vaginalis (Winklemann)	6
Repair urinary fistula	1
External urethrotomy	5
„ with removal of stone from urethra	1
Removal of cord and testis	2
Orchidectomy of left side and excision of inguinal glands—sarcoma of testis	1
Partial amputation of penis	1
Total amputation of penis	1
Excision of fibroma of labia (vulva)	1
Replacement of bladder (inversion)	1
Fistula in ano	8
Excision of fissure in ano	1
„ ischio rectal sinus	1
„ piles	3
Imperforate anus	2
Colpo-perineorrhaphy	1
Colporrhaphy and partial posterior colpo-perineorrhaphy	1
Total	299



## CAUSE OF DEATH FOLLOWING MAJOR OPERATIONS.

Nature of operation.						Cause of death.
1.	Decompression	operation—compound	fracture			Cerebral laceration
	skull	...	...	...	...	
2.	Excision—sarcoma—cervical	glands	...	...		Malignant cachexia
3.	Sequestrectomy—femur—suppurative	osteoperios-				
	titis	...	...	...	...	Toxaemia
4.	Amputation—crushed leg	...	...	...	...	Acute enteritis
5.	„	„	...	...	...	Septicaemia
6.	Laparotomy—acute appendicitis with	general				
	peritonitis	...	...	...	...	Toxaemia of general peritonitis
7.	„	acute appendicitis with	general			
	peritonitis	...	...	...	...	„
8.	„	acute appendicitis	...	...	...	Phagedena of abdominal wall
9.	„	general peritonitis with	appendicitis			Toxaemia of gen. peritonitis
10.	„	general peritonitis	...	...	...	„
11.	„	general peritonitis	...	...	...	„
12.	„	peritonitis—liver abscess	...	...	...	„
13.	„	perforated gall bladder	...	...	...	„
14.	„	plastic peritonitis	...	...	...	„
15.	„	perforated gastric ulcer	...	...	...	„
16.	„	perforated gastric ulcer with	general			
	peritonitis	...	...	...	...	„
17.	„	strangulated hernia	...	...	...	„
18.	„	strangulated hernia with	general			
	peritonitis	...	...	...	...	„
19.	„	stab wound of stomach & intestines				„
20.	„	chronic pancreatitis	...	...	...	Toxaemia
21.	„	acute gastro-enteritis	...	...	...	Acute gastro-enteritis
22.	„	traumatic ruptured liver and spleen				Shock and haemorrhage
23.	„	ruptured liver—revolver shot	...			„
24.	„	stab wound of liver, stomach and				
	gut	...	...	...	...	„
25.	„	ruptured tubal pregnancy	...	...	...	„
26.	„	gall stones	...	...	...	Cholangitis
27.	„	resection of gut—railway accident				Shock (splanchnic)
28.	„	aortic aneurism	...	...	...	Ruptured aneurismal haemor-
						rhage
29.	„	drainage ovarian cyst	...	...	...	Toxaemia
30.	„	ruptured bladder	...	...	...	Shock
31.	„	gastric ulcer and vesicular mole	...			Haemorrhage
32.	Herniotomy—inguinal—strangulated	...	...			Toxaemia
33.	„	„	„	...	...	„
34.	Drainage—subphrenic abscess	...	...	...	...	Chronic dysentery
35.	„	„	...	...	...	„
36.	Excision of hydrosalpinx	...	...	...	...	Septicaemia
37.	Resection of rib	...	...	...	...	Empyema
38.	Resection of gut—intestinal obstruction	...	...			Shock and toxaemia
39.	Ligaturing of internal iliac artery and excision of					
	aneurism of obturator artery	...	...	...	...	Shock and haemorrhage
40.	Nephrectomy—stab wound of kidney	...	...			„

## APPENDIX G.

## ANNUAL REPORT OF THE CHIEF SURGEON, SELANGOR.

The Surgical Work of Selangor has shown a considerable increase during 1927.

The following figures show the number of major operations performed in the hospitals of Kuala Lumpur during the past three years :

	1925.	1926.	1927.
European Hospital ... ..	34	46	75
General Hospital ... ..	152	198	306
District Hospital ... ..	71	71	45

The total number of minor operations performed during 1927 was 831.

The total number of deaths following major operations were as follows :

European Hospital ... ..	Nil
General Hospital ... ..	24
District Hospital ... ..	7

It is still to be deplored that Asiatic patients delay admission to hospital until surgical interference can only be undertaken at considerable risk.

It is gratifying to record the first appointment in this country of a Specialist Anaesthetist. Dr. Mary Minahan acted in this capacity for some months until Dr. C. P. Allen assumed duty.

There has been no anaesthetic death during the year.

## SYNOPSIS OF MAJOR OPERATIONS DURING 1927.

## I.—AT THE EUROPEAN HOSPITAL.

	Total.	Deaths.	Remarks.
(a) <i>Abdominal—</i>			
Posterior gastro-jejunostomy ... ..	5	—	Two for chronic duodenal, two for chronic gastric ulcers, one for perforated chronic gastric ulcer and general peritonitis
Appendicectomy ... ..	19	—	Three with plication of caecum and colopexy
Appendicectomy with drainage for peritonitis ... ..	1	—	
Cholecystectomy ... ..	2	—	For chronic cholecystitis with gall-stones
Exploratory laparotomy ... ..	1	—	With drainage for pelvic peritonitis of tubal origin
Ovariectomy ... ..	1	—	For multilocular cyst
Nephro-lithotomy ... ..	1	—	
Removal of stone in ureter ... ..	1	—	Impacted in pelvic portion with drainage of pyonephrosis
Suprapubic cystostomy ... ..	1	—	For inoperable carcinoma of prostate and bladder
Inguinal hernia ... ..	4	—	Radical cure
(b) <i>Perineal, etc.—</i>			
Operations for haemorrhoids ... ..	5	—	
Operations for fistula in ano ... ..	3	—	
Excision of testicle ... ..	1	—	For torsion of seven days' duration
Excision of hydrocele of canal of Nuch ... ..	1	—	
Excision of Bartholin's cyst ... ..	1	—	



## AT THE EUROPEAN HOSPITAL—(cont.)

			Total.	Deaths.	Remarks.
(c) <i>Limbs—</i>					
Plating of fractured tibia ...	...	1	...	—	For non-union and mal-position
Amputation of arm ...	...	2	...	—	One for gas gangrene
Amputation of toes ...	...	1	...	—	Supernumerary digits
Excision of internal semi-lunar cartilage of knee ...	...	1	...	—	
Suture of tendons ...	...	1	...	—	
(d) <i>Various—</i>					
Excision of breast ...	...	1	...	—	With pectorals and glands for spheroidal-celled carcinoma
Excision of cyst of breast ...	...	1	...	—	
Excision of fibroadenoma of breast ...	...	4	...	—	
Excision of glands in neck ...	...	1	...	—	
Excision of persisting branchial structures in neck ...	...	1	...	—	
Enucleation of eye ...	...	1	...	—	
Enucleation of tonsils ...	...	13	...	—	

## II.—AT THE GENERAL HOSPITAL.

(a) <i>Abdominal—</i>					
Stab wounds of abdomen ...	...	1	...	—	End to end anastomosis of ileum
Stab wounds of abdomen ...	...	3	...	2	Suture of intestines (general peritonitis)
Stab wounds of abdomen ...	...	3	...	2	Without visceral injury
Appendicectomy ...	...	11	...	—	Without drainage. One with plication of caecum
Appendicectomy ...	...	4	...	2	With drainage for gangrenous appendicitis and general peritonitis
Drainage operation for localised appendix abscess ...	...	8	...	—	
Posterior gastro-jejunostomy for perforated chronic duodenal ulcer ...	...	1	...	—	With drainage for general peritonitis
Posterior gastro-jejunostomy for chronic gastric ulcer ...	...	4	...	—	
Posterior gastro-jejunostomy for chronic duodenal ulcer ...	...	7	...	—	
Gastrostomy for stricture of oesophagus ...	...	1	...	—	
Drainage operation for general peritonitis ...	...	3	...	3	Of unknown origin
Drainage operation for pelvic peritonitis ...	...	1	...	—	Following salpingitis
Extraction of bullet and suture of colon ...	...	1	...	—	Bullet wound
Inguinal colostomy ...	...	1	...	—	Inoperable carcinoma of rectum
Resection of Meckel's diverticulum ...	...	1	...	—	
Acute intestinal obstruction by bands ...	...	1	...	—	
Exploratory laparotomy ...	...	5	...	—	
Suture of ruptured liver ...	...	1	...	—	
Drainage operation for liver abscess ...	...	4	...	—	

## GENERAL HOSPITAL—(cont.)

				Total.	Deaths.		Remarks.
Cholecystostomy	...	...	...	4	...	4	Gangrenous cholecystitis with general peritonitis
Cholecystectomy	...	...	...	6	...	—	Two with gall-stones, four chronic cholecystitis
Transthoracic drainage of subphrenic abscess	...	...	...	2	...	—	
Splenectomy	...	...	...	6	...	—	One for splenomagaly, five for rupture
Nephrectomy	...	...	...	2	...	1	For hydro-nephrosis. Death following excision of congenital hydro-nephrosis and hydro-ureter in child
Nephro-lithotomy	...	...	...	1	...	—	
Radical cure for inguinal hernia	...	...	...	21	...	—	
Operations for strangulated inguinal hernia	...	...	...	4	...	—	With radical cure of herniae
Operation for strangulated femoral hernia	...	...	...	1	...	—	Radical cure of herniae
Operation for ventral hernia	...	...	...	1	...	—	Following operation for perforated gastric ulcer
Salpingo-oöphorectomy for ectopic gestation	...	...	...	3	...	—	
Salpingectomy	...	...	...	3	...	—	One pyosalpinx, two hydrosalpinx
Exploration and drainage for pyosalpinx	...	...	...	1	...	—	
Caesarian section for obstructed labour	...	...	...	3	...	3	Late cases after prolonged intrauterine manipulations, etc.
Ovariectomy	...	...	...	6	...	—	For cysts
Hysterectomy for fibromyomata	...	...	...	1	...	—	
Excision of fibroma of broad ligament	...	...	...	1	...	—	
Gilliam's sling operation for retroverted uterus	...	...	...	4	...	—	
(b) <i>Perineal</i> —							
Operation for stricture of rectum	...	...	...	1	...	—	
Radical cure for fistula in ano	...	...	...	9	...	—	
Lockhart Mummery's operation for prolapse of rectum	...	...	...	1	...	—	
Excision of condyloma of anus	...	...	...	1	...	—	
Ligature operation for haemorrhoids	...	...	...	9	...	—	
Operation for congenital atresia of rectum and anus	...	...	...	1	...	1	
(c) <i>Genito-Urinary</i> —							
Suprapubic lithotomy	...	...	...	7	...	—	
Partial amputation of penis	...	...	...	2	...	—	For epithelioma
Complete amputation of penis	...	...	...	1	...	—	For epithelioma
Radical cure for vaginal hydrocele	...	...	...	11	...	—	
Orchidectomy	...	...	...	3	...	—	For tuberculous epididymitis
(d) <i>Gynaecological</i> —							
Dilatation and curettage	...	...	...	13	...	—	Eleven for retained product of conception. Two for relief of dysmenorrhoea
Excision of tumour of cervix	...	...	...	1	...	—	
Excision of prolapsed gangrenous fibromyomatous polypus	...	...	...	1	...	—	With inversion of uterus



## GENERAL HOSPITAL—(cont.)

	Total.	Deaths.	Remarks.
(e) <i>Head and Neck</i> —			
Operations for depressed fracture of skull ... ..	4	1	Decompressions
Schwartz's operation for mastoid disease ... ..	9	—	
Excision of superior maxilla for malignant growth ... ..	2	1	One with preliminary laryngotomy
Rose's operation for hare-lip ...	5	—	
Excision of naso-pharyngeal tumour ... ..	1	—	
Tracheotomy for laryngeal diphtheria ... ..	2	2	Late toxic cases
Turbineotomy ... ..	3	—	
Drainage operation for Empyema of Antrum ... ..	1	—	
Ligature of external carotid artery	1	—	As a preliminary to excision of superior maxilla
Suture of severed vessels in stab wounds of neck and thorax ...	1	—	
Excision of sarcoma of parotid gland ... ..	2	—	
Excision of glands of neck ...	4	—	
Excision of simple tumours of face and neck ... ..	4	—	
Enucleation of tonsils ... ..	12	—	
(f) <i>Operations on Thorax</i> —			
Excision of breast for cystic adenoma ... ..	1	—	
Intercostal incision and drainage for empyema ... ..	2	—	
Resection of rib and drainage for empyema ... ..	1	—	
Resection of rib (for tuberculous rib) ... ..	1	—	
(g) <i>Limbs</i> —			
Amputations:			
(a) Arm ... ..	1	—	
(b) Hand ... ..	1	—	
(c) Fingers ... ..	7	—	
(d) Thigh ... ..	1	—	
(e) Leg ... ..	5	1	Compound fractures comminuted
(f) Symes ... ..	1	—	
(g) Toes ... ..	4	—	
Plating of humerus for non-union	1	—	
Plating of femur ... ..	1	—	
Wiring for fracture of patella ...	4	—	
Sequestrectomy (mandible) ...	3	—	
Sequestrectomy tibia ... ..	2	—	
Arthrotomy and excision of head of femur for old dislocation of hip joint ... ..	1	1	
Anterior exposure of left hip joint and drainage for osteo-myelitis of ilium ... ..	1	—	
Open reposition of fragments for compound fracture of tibia and fibula ... ..	2	—	
Open operation for malunion of radius and ulna ... ..	1	—	
Extraction of bullet in tibia ...	1	—	

## GENERAL HOSPITAL—(cont.)

	Total.	Deaths.	Remarks.
Diaphysectomy for acute osteomyelitis of fibula ... ..	1	...	—
Osteotomy for malunited fracture of femur ... ..	1	...	—
Excision of osteoma of os calcis ...	1	...	—
Plastic operation for webbed fingers ... ..	1	...	—
Incision for suppurative arthritis (knee) ... ..	1	...	—
Exploration of knee for foreign body ... ..	1	...	—
Incision for chronic periostitis of tibia ... ..	1	...	—
Murphey's tenoplasty for musculo-spiral paralysis ... ..	1	...	—
Suture of median nerve ... ..	1	...	—
Excision of carpal ganglion ...	1	...	—
Suture of severed brachial plexus	1	...	—
Excision of large sebaceous cyst of buttock ... ..	1	...	—
Excision of fibrosarcoma of anterior tibial nerve ... ..	1	...	—
Suture of tendons ... ..	2	...	—
Ligation of varicose veins of legs	1	...	—
Exploration for chronic iliac abscess ... ..	1	...	—
Extraction of foreign body from limbs ... ..	3	...	—
Lengthening tendo achillis for paralytic talipes ... ..	1	...	—

The following operations at the District Hospital were performed by Dr. C. S. Wilson, who also acted for me in the other Hospitals on those occasions when I have been absent from Kuala Lumpur.

## III.—AT THE DISTRICT HOSPITAL.

## (a) Abdominal—

Multiple stab wounds ... ..	1	...	1	...	Suture of stomach, general peritonitis
Drainage operation for peritonitis	3	...	1	...	Cause unknown
Radical cure for inguinal hernia	4	...	—		
Operations for strangulated inguinal hernia ... ..	4	...	2	...	Late cases of spontaneous faecal fistula in gangrene of intestine
Mayo's operation for umbilical hernia ... ..	1	...	—		
Drainage operation for liver abscess ... ..	1	...	—		
Cholecystectomy ... ..	1	...	—		
Splenectomy ... ..	2	...	—	...	Rupture of spleen
Subtotal hysterectomy ... ..	1	...	—		
Drainage operation for pyosalpinx	1	...	—		
Excision of spindle-cell sarcoma of abdominal wall ... ..	1	...	—		

## (b) Perineal—

Whitehead's operation for prolapse of rectum ... ..	1	...	—
Colpo-perineorrhaphy ... ..	1	...	—



## DISTRICT HOSPITAL—(cont.)

				Total.	Deaths.	Remarks.
(c) <i>Genito-Urinary</i> —						
Suprapubic cystostomy	...	...	...	1	—	For bladder drainage
Suprapubic lithotomy	...	...	...	1	—	
Radical cure of vaginal hydrocele	...	...	...	3	—	
Orchidectomy	...	...	...	1	—	Chronic suppurating hydrocele
(d) <i>Head and Neck</i> —						
Operations for depressed fracture of skull	...	...	...	1	—	With ligation of middle meningeal artery
Sub-temporal decompression	...	...	...	1	—	Fracture of skull
Schwartz's operation for mastoid disease	...	...	...	1	1	Lateral sinus thrombosis and pyaemia
Enucleation of eye-ball	...	...	...	1	—	
Excision of endothelioma and bloc dissection of glands	...	...	...	1	1	
Excision of tuberculous glands of neck	...	...	...	1	—	
Ligature of common carotid artery for aneurysm	...	...	...	1	1	Died of cerebral anaemia
Excision of keloids of neck	...	...	...	1	—	
(e) <i>Limbs</i> —						
Amputations:						
(a) Thigh	...	...	...	3	—	
(b) Leg	...	...	...	2	—	
Excision of head of femur	...	...	...	1	—	For fracture dislocation
Wiring fracture of olecranon	...	...	...	1	—	
Open reposition for compound fracture of leg	...	...	...	1	—	
Repair to lacerated wound exposing knee-joint	...	...	...	1	—	

R. M. DANNATT,  
Chief Surgeon, Selangor.

## APPENDIX H.

ANNUAL REPORT OF THE CHIEF SURGEON, NEGRI SEMBILAN,  
FOR THE YEAR 1927.

## ANALYSIS OF MAJOR OPERATIONS FOR THE YEAR 1927.

## GENERAL AND EUROPEAN HOSPITALS, SEREMBAN.

	Emergency operations.	Total.	Died.
<i>Abdominal—</i>			
Exploratory laparotomy for stab wounds and accidents	...	8	...
Appendicitis, simple	...	13	...
„ with abscess (died of pulmonary tuberculosis)	...	6	...
„ gangrenous	...	6	...
Perforated gastric ulcer. Closing perforation	...	1	...
Gastroenterostomy for pyloric stenosis	...	3	...
„ duodenal stenosis	...	1	...
„ duodenal ulcer	...	2	...
„ carcinoma	...	1	...
„ perforated gastric ulcer	...	1	...
General peritonitis	...	4	...
Short circuit for intussusception	...	1	...
„ stenosis of splenic flexure	...	1	...
Abdominal abscess	...	3	...
Hepatic abscess open operation	...	5	...
Splenectomy (one for intracapsular rupture)	...	2	...
Cholecystectomy	...	2	...
Caecal fistulae	...	1	...
Partial colectomy	...	1	...
Adeno carcinoma of intestine	...	1	...
Colostomy for imperfect anus of undescended rectum	...	1	...
Funiculitis	...	3	...
Exploratory for continual vomiting after gastro enterostomy	...	1	...
„ tuberculosis peritonitis (obstruction)	...	1	...
Haemorrhagic pancreatitis	...	1	...
Umbilical fistulae-excision	...	1	...
Gangrene of caecum-caecostomy	...	1	...
<i>Hernia—</i>			
Hernia inguinal	...	17	...
„ strangulated	...	7	...
<i>Head and Neck—</i>			
Excision of tubercular glands neck	...	2	...
Mastoiditis	...	4	...
Compound fracture of skull-exploration drainage	...	3	...
Subdural haemorrhage	...	1	...
Tonsillectomy	...	2	...
Cut throat	...	2	...
Tracheotomy for diphtheria	...	1	...
Cavernous naevus of lip	...	1	...
Excision of eye	...	2	...
Iridectomy	...	1	...
<i>Chest—</i>			
Empyema (resection of rib)	...	6	...
<i>Ano-Rectal—</i>			
Haemorrhoids	...	6	...
Fistulae in ano	...	2	...
Ischio-rectal abscess	...	1	...



	Emergency operations.						Total.	Died.	
<i>Urinary—</i>									
External urethrotomy for stricture	...	...	...	...	...	...	4	...	—
"    "    impacted stone	...	...	...	...	...	...	3	...	—
"    "    urethral fistulae	...	...	...	...	...	...	2	...	—
"    "    (multiple stricture with vesical haemorrhage)	...	...	...	...	...	...	1	...	1
"    "    fistulae and stricture	...	...	...	...	...	...	1	...	—
"    "    ruptured urethra	...	...	...	...	...	...	1	...	—
Suprapubic cystotomy for vesical calculus	...	...	...	...	...	...	5	...	—
Extravasation of urine	...	...	...	...	...	...	1	...	1
Periurethral abscess	...	...	...	...	...	...	1	...	—
Plastic operation prepuce	...	...	...	...	...	...	1	...	—
Epithelioma of penis—complete amputation	...	...	...	...	...	...	1	...	—
<i>Gynaecological—</i>									
Ectopic gestation	...	...	...	...	...	...	2	...	—
Salphingo oophorectomy	...	...	...	...	...	...	1	...	—
Curettage for endometritis	...	...	...	...	...	...	1	...	—
<i>Recto-vesical—</i>									
Wound of rectum and bladder repaired	...	...	...	...	...	...	1	...	—
<i>Limbs—</i>									
Lacerated wounds	...	...	...	...	...	...	1	...	1
Popliteal tumour (chronic inflammatory)	...	...	...	...	...	...	1	...	—
Ununited neck of femur-bone pegging	...	...	...	...	...	...	1	...	—
Amputation of leg	...	...	...	...	...	...	2	...	1
"    fore arm	...	...	...	...	...	...	1	...	—
"    fingers	...	...	...	...	...	...	1	...	—
Debridement and suture of fracture	...	...	...	...	...	...	5	...	—
Sequestrectomy	...	...	...	...	...	...	3	...	—
Arthrotomy for loose body (knee)	...	...	...	...	...	...	1	...	—
"    septic arthritis	...	...	...	...	...	...	1	...	—
Tendon suture	...	...	...	...	...	...	1	...	—
Exploration of musculo spiral nerve	...	...	...	...	...	...	1	...	—
Phagedaena of foot (excision)	...	...	...	...	...	...	1	...	—
Cellulitis of hand	...	...	...	...	...	...	2	...	—
Tumour	...	...	...	...	...	...	1	...	—
Bursitis—excised	...	...	...	...	...	...	1	...	—
Total							180	...	28

## ANALYSIS OF METHODS OF ANAESTHESIA.

						Major operation.	Minor operation.
Chloroform	...	...	...	...	...	23	6
Aether	...	...	...	...	...	8	1
Aether per rectum	...	...	...	...	...	4	1
Chloroform and aether	...	...	...	...	...	93	44
Spinal stovain	...	...	...	...	...	43	4
Novocaine local	...	...	...	...	...	9	60
Ethylchloride	...	...	...	...	...	—	385
Total						180	501

Total major operations 180.

Total minor operations 702.

One hundred and eighty major operations with 28 deaths. Death-rate 15.5 per cent.

Eight emergency operation with three deaths. Death-rate 37.05 per cent.

Mortality rate excluding emergency cases that proved fatal was 14.12 per cent.

One case of appendicular abscess died of pulmonary tuberculosis.

## COMPARISON WITH PREVIOUS YEAR.

Year.	Major cases.		Death.	Mortality.		Minor cases.	
1927	...	180	28	...	15.5%	...	702
1926	...	87	20	...	22.98%	...	768

C. B. PASLEY,  
Chief Surgeon, Negri Sembilan.

## APPENDIX I.

ANNUAL REPORT OF THE MEDICAL SUPERINTENDENT, CENTRAL  
MENTAL HOSPITAL, FOR THE YEAR 1927.

Sir,—I have the honour to forward the seventeenth annual report of the Central Mental Hospital, that for the year 1927.

	Males.	Females.	Males.	Females.
2. There remained on December,				
1926 ... ..	1,212	338		
Admitted during 1927 ... ..	585	188		
Discharged—Recovered ... ..	228	64		
Relieved ... ..	50	17		
Not improved ... ..	39	15		
Not insane ... ..	1	—		
Absconded ... ..	63	1		
Died ... ..	100	43		
Remaining on 31st December, 1927	—	—	1,316	386
<i>Singapore.</i> —				
Remained on 31st December, 1926	108	101		
Admitted during 1927 ... ..	1	—		
Discharged ,, ... ..	2	—		
Died ,, ... ..	2	7		
Remaining on 31st December, 1927	—	—	105	94
<i>Criminals.</i> —				
Remained on 31st December, 1926	96	—		
Admitted during 1927 ... ..	45	1		
Discharged ,, ... ..	21	—		
Died ,, ... ..	5	—		
Remaining on 31st December, 1927	—	—	115	1
<i>Kedah.</i> —				
Remained on 31st December, 1926	115	27		
Admitted during 1927 ... ..	58	14		
Discharged ,, ... ..	16	4		
Died ,, ... ..	11	2		
Absconded ,, ... ..	4	—		
Remaining on 31st December, 1927	—	—	142	35
<i>Perlis.</i> —				
Remained on 31st December, 1926	13	4		
Admitted during 1927 ... ..	3	—		
Discharged ,, ... ..	1	—		
Died ,, ... ..	1	—		
Absconded ,, ... ..	1	—		
Remaining on 31st December, 1927	—	—	13	4
<i>Kelantan.</i> —				
Remained on 31st December, 1926	6	1		
Admitted during 1927 ... ..	4	1		
Discharged ,, ... ..	1	—		
Died ,, ... ..	1	1		
Remaining on 31st December, 1927	—	—	8	1
Total remaining on 31st December,				
1927 ... ..	—	—	1,699	521
Percentage of recoveries ... ..	37.77			
,, death on total treated ...	5.95			
,, daily average ...	8.19			

3. This total of 2,220 shows an increase of 193 over last year, against 126 in 1926 and 150 in 1925.

4. This increase in Federated Malay States patients is the largest we have ever had.

5. There is an increase in all classes of patients save those of Singapore, where there is a reduction of ten.



6. This is of course due to the fact that we no longer take Singapore patients.

7. One however appears in the Singapore admissions, which is due to the fact that a Straits Settlements patient from near the border was sent to a Federated Malay States Hospital, and from there sent here. Instead of sending the patient to Singapore, it was decided to keep him here.

8. Perlis patients, of whom we have 17, appear under a separate head this year for the first time.

9. This does not mean that we took patients for the first time in 1927, but they were previously included in the Kedah returns, which was a mistake as Perlis has for years paid for her own patients.

10. Kedah and Perlis combined, show an increase of 35 against 26 last year and 15 the year before.

11. Kelantan shows an increase of two.

12. Criminal patients show an increase of 20, against 13 last year and six the previous one.

13. An increase is almost a certainty in a mental hospital, for one rarely finds the deaths and discharges equalling the admissions. So that, whereas in a general hospital one has two classes—recoveries and deaths, in a mental hospital there is a residuum of chronics who remain for life. I remember when I was at Hatton Mental Hospital we had a hale hearty old man who had been in the hospital 56 years.

14. *Admissions.*—We admitted last year the extraordinary total of 900 patients, which shows an increase of 165 on last year, when we admitted 735. In 1925 the total admissions were 666. There are several probable factors in this increase, i.e., the increase of population, the higher speed at which life is lived amongst the oriental population, and the greater competition. There is no doubt but the oriental is following the occidental in living a more strenuous life. Again people are becoming more and more ready to bring their relations to hospital.

Again there is the pressure of western education, which every parent who can afford it presses upon his children irrespective of whether they are capable of it or not.

15. As regards Federated Malay States patients, with whom I shall deal exclusively in the tables which will be found in the appendix, we admitted 773 against 644 so that we cannot blame the Unfederated Malay States for the large increase in numbers.

16. The month which provided the most admission was January with 79, then came November with 76 followed by March and May with 71 each.

17. Last year, October and January showed the most admissions while in 1925 May and July were the heaviest months.

18. Seeing the way the admission varies from year to year there is not much on which to base a conclusion.

19. Again Kuala Lumpur, Ipoh and Taiping supply us with the largest number of cases.

20. Primary dementia again heads the list of diseases on admission. Recent melancholia and recent mania again occupying the second and third places, while confusional insanity and general paralysis of the insane occupy the fourth and fifth.

21. There was a considerable diminution in the number of cases of general paralysis of the insane admitted, and as usual we noted that it was confined to the Chinese.

22. Primary dementia still continues to increase at an alarming rate, showing 286 cases in 1927 against 216 the year before. This is a particularly deplorable condition of things seeing that it is the young that are attacked, and also the probability of a recurrence, even in cases where an apparent cure has been obtained.

23. To me it is a sign that more care should be exercised in the choice of boys for higher education. Many boys, who would be perfectly well at a trade are pushed to make bad clerks instead of useful mechanics. Many of these boys break down as a result of the attempt to make them that they were never intended to be.

24. *Discharges.*—Discharges number 414 against 360 last year and 276 in 1925.

25. Of those, 292 were discharged recovered against 207 in 1926 and 177 in 1925.

26. Those discharged “relieved” number 67 while the balance of 55 was made up of one not insane and 54 who were discharged “unimproved” under bond, who, in the vast majority of cases, were removed to their own country by their friends.



27. Some of the 67 discharged "relieved" would certainly have been added to the recoveries had they remained a little longer, but I think it advisable not to make it too difficult for people to remove their relatives, if one can be satisfied there is no danger to any one, and that the patient's recovery is not likely to be jeopardised. The result of this is that people are much more willing to bring their ailing relatives for early treatment.

28. *Recoveries.*—The recoveries number 292 against 207 in 1926 and 177 the previous year.

29. The recovery rate works out at 37.77 against 32.17 in 1926 and 31.38 in 1925.

30. This is a most hopeful sign, and I can only hope that the improvement continues.

31. Of course there were a number of cases of primary dementia amongst these, and one fears that one will see all too many of them returning.

32. Of the forms from which these discharged patients were suffering on admission, recent melancholia shows the greatest number of recoveries. Primary dementia is next followed by recent mania and confusional insanity.

33. If, however, we take the proportion of recoveries to admission, we find that of the four, confusional insanity was the most recoverable; recent melancholia next, then recent mania with primary dementia a bad fourth.

34. When with the small proportion of recoveries we remember that recurrences are probable, we can see how serious a matter the increase in this form of mental disease is.

35. *Aetiology.*—When one turns to the aetiological table one finds the order much the same as last year. Haemopoetic system and gastro intestinal system are again first and second, but syphilis has displaced cardio-vascular degeneration in the third place, while alcohol has fallen to fifth place though it again shows an increase in actual appearances—88 against 78 in 1926.

36. It should be pointed out, however, that the first three rarely appear as a primary cause; while syphilis and alcohol appear far more frequently as a primary cause than a contributory, especially in the case of syphilis.

37. In addition to syphilis and alcohol appearing as primary causes, one notices that we have on 98 occasions cardio-vascular degeneration appearing as a secondary cause. A large number of these cases of cardio-vascular degeneration might be laid at the door of either syphilis or alcohol, so one sees how important these two are as causes of the mental ill-health of the Federated Malay States.

38. Syphilis has always, at least in our time, been here, but alcohol is more or less a recent cause and its appearance may be dated from the day that attempts to cut off opium were made.

39. I wonder have the people who cry out against opium thought of the alternative and the crimes attributable to alcohol which opium never gives rise to.

40. Of the less common causes adolescence and mental strain taken together make a total of nearly 70 and one wonders how many of these are due to education above the boys' capacity; I fear a great many.

41. Malaria appears 56 times and the climateric 43.

42. Influenza appears 21 times and I believe was, could one only have traced it, responsible for many more of our cases. When one notices the large increase in both melancholia and confusional insanity, one is lead to believe that influenza, which was undoubtedly very prevalent in a mild form, was responsible for more than the 21 cases which we were justified in attributing to this cause.

43. Congenital syphilis was responsible for seven cases. This is remarkable as, though we would expect otherwise, hitherto congenital syphilis has been conspicuous by its absence as a cause.

44. *Deaths.*—The total number of deaths was 173 giving a death-rate of 5.95 on the total treated and 8.19 on daily average.

45. This is a considerable increase on last year, when the rates were 5.01 and 6.61, respectively, while in 1925 they were 5.31 and 7.1.

46. The principal causes were general paralysis of the insane which again heads the list, though it only appears 39 times against 47. Even so 39 deaths from a disease whose presence was denied 16 years ago is rather remarkable, and needs explanation.

47. I spoke of this last year and will content myself by saying that I believe it is due, together with syphilis, which is no new disease, to the increased consumption of alcohol amongst the Chinese, who have more or less a monopoly of general paralysis of the insane.



48. The next two on the list are dysentery and pulmonary tuberculosis, both diseases found in overcrowded places. We are now getting to that stage. Is there anything in the increased deaths from phthisis and dysentery?

49. Dysentery and pulmonary tuberculosis both show an increase over last year but it must be remembered that we had many more patients.

50. Though we had 24 deaths from pulmonary tuberculosis it must be remembered that a mental hospital population always shows a larger proportion of phthisis than the ordinary outside population.

51. There is a marked increase in pneumonia which shows 18 cases against two last year. Nine of these 18 were due to influenza which itself accounted for six cases. So that influenza had something to do with our increased death-rate.

52. *Suicides*.—I am glad to say we had no suicides during 1927, though suicidal cases were more numerous than ever. We had 43 cases stated to be suicidal on admission against 31 in 1926. When one remembers the extremely badly lighted wards we have at the Central Mental Hospital, I think we may derive considerable satisfaction from the absence of suicide.

53. *Fatalities*.—We had three fatalities during the year against eight the year before.

54. One death was due to a fractured base of the skull due to a patient falling from a bedboard. The other two were the result of ruptured spleens sustained in fights with other patients. Both spleens were extremely enlarged.

55. *Abscondings*.—There were 69 cases of absconding against 85 in 1926 and 83 in 1925.

56. Sixty-nine abscondings of course is a very large number, but it at least proves the absence of the "prison idea".

57. It is of course too large a number and in a great many cases was due to carelessness, which was suitably dealt with.

58. Most of the cases came back within a few days either of their own accord, by being found by our own attendants or captured by the police. A few came back on new certificates—one about six months after his escape.

59. *Criminals*.—There were 45 criminals admitted, against 38 in 1926 and 25 the previous year.

60. There were 21 discharges against 17 in 1926, and 13 the year before.

61. Of the 21 discharges, 11 were not insane, 10 of whom were convicted and one acquitted.

62. No criminal patient absconded.

63. The criminal work becomes heavier yearly, and entails much travelling, which takes one away from one's work much too frequently. Cases, in which evidence as to the mental condition of the accused had to be given, appeared at the Assizes in Alor Star, Kuantan, Kuala Lipis, Seremban to say nothing of several in Kuala Lumpur and Ipoh.

64. The Medical Superintendent of a British County or Borough Mental Hospital is not made responsible for criminal patients who go to Broadmore and such places.

65. Seeing the way our criminal cases are increasing, the day is not far off when the advisability of building such a place for Malaya will have to be considered.

66. *New buildings*.—A single nurse's quarters and three "Kennison" houses were commenced in 1927. The only other work done was the enlargement of the Conolly Norman Wards—male and female.

67. The new store, the female infectious diseases ward, the enlargement of the office and the visitors rooms have not yet been commenced, though I understand tenders have been called.

68. The first class wards are not yet ready for occupation, and the nurses, five of whom are in the country, are accommodated, one in Batu Gajah Hospital, and four in a Survey Department house near Tanjong Rambutan Railway Station.

69. *Farms*.—One new farm was built during the year and another was commenced. We have now 15 farms in occupation which accommodate about 350 patients.

70. The farms have proved very useful in the way of providing healthy occupation for the patients, and also as places where patients can have a much larger amount of freedom than in the wards, and thus prepare for their return to their daily life outside.

71. Another point of view is the revenue they produce, or rather the revenue they save, as all products are consumed in the institution.



72. In 1927 the farms produced, by the industry of the patients, produce to the value of \$60,536.70.

73. Again the farms are useful in that if it were not for the accommodation they provide we would have to refuse patients, as the building programme has fallen into such terrible arrears.

74. *Anti-malarial Work.*—Two thousand six hundred and four feet of concrete inverts were laid during the year against 1,430 in 1926, and in addition we made, as we have done since the Sungei Bulat Scheme was started, every invert used.

75. It will be noticed that Sungei Bulat Nos. 1, 2, 3 and 4 are mentioned. Sungei Bulat No. 1 is the main stream in which we laid 888 feet of inverts; where we also make a sort of shelf at the top of the invert to give a broader upper section to the drain, and then build a wall at the outside of the shelf. From the top of this wall we slope and sod the bank.

76. Nos. 2, 3 and 4 are tributaries and in them only the invert is laid and the slope comes direct from the top of the invert. All the sloping and sodding is done immediately we lay six inverts so that in case of rain the banks will not be washed into the inverts and choke them, as happened once before.

77. Besides laying inverts we also laid 3,876 feet of sub-soil pipes ranging from two to six inches in diameter.

78. To enable work in the Sungei Bulat to be done with greater ease we diverted the stream above the Woodside-Grangegorman Farm bridge so as to carry the water down the ravine which takes the back main drain of the hospital.

79. Oiling was carried out systematically by the Mosquito Destruction Board, so that altogether the mosquitoes did not have it all their own way.

80. The malarial incidence was .52 on cases and .48 on individuals against 1.9 and 1.6, respectively, last year and .73 and .66 the year before.

81. *Staff.*—The following changes took place amongst the staff in 1927:

Mangathayee, Female Assistant Head Attendant, was appointed on 1st January, 1927.

Gurmukh Singh, Assistant Medical Officer, was transferred from Batu Gajah on 16th January, 1927.

T. Arumugam, Assistant Physician, was transferred to Batu Gajah on 17th January, 1927.

Miss F. L. Webb, European Nurse, arrived in the State on 27th January, 1927, and was stationed at Batu Gajah.

S. V. Suppiah, Probationer Dresser, was promoted to Dresser, Grade III, on 16th February, 1927.

Kesari Rai, Head Attendant, retired on pension on 1st May, 1927.

G. A. Lopez, Assistant Physician, was transferred to Kuala Lumpur on 1st May, 1927.

A. R. Muthiah, Assistant Physician, was transferred from Kuala Lumpur on 1st May, 1927.

G. L. Gune, Assistant Physician, was appointed on 3rd May, 1927.

Lam Chong Choong, Clerk, Class III, services were dispensed with on 2nd April, 1927.

Yap Thiah Fook, Clerk, Class III, was appointed on 18th May, 1927.

C. Mylvaganam, Probationer Dresser, passed the Preliminary Examination of the Royal Medico-Psychological Association of Great Britain and Ireland on 3rd May, 1927.

C. Mylvaganam, Probationer Dresser, was promoted to Dresser, Grade III, on 4th May, 1927.

Abdul Ghaffur, Watchman, was appointed on 20th April, 1927.

G. E. Jones, Agricultural Officer, was transferred to the Cameron's Highlands, Tapah, on 15th July, 1927, and not replaced.

Mr. J. R. G. Young, European Male Nurse, arrived in the State on 29th June, 1927.

Mrs. J. R. G. Young, European Nurse, arrived in the State on 29th June, 1927.

Sui Raj, Assistant Head Attendant, died in India on 23rd September, 1927, while on 42 days' vacation leave and six months' half-pay leave from 1st April, 1927.

Gurmukh Singh, Assistant Medical Officer, proceeded to India on 6th May, 1927, on 36 days' vacation leave and five months' half-pay leave and two months' no-pay leave.



Mr. T. J. Wimsey, European Male Nurse, arrived in the State on 1st December, 1927.

Mr. John Smith, European Male Nurse, arrived in the State on 1st December, 1927.

Coopamah, Female Night Assistant Head Attendant, services were dispensed with on 21st December, 1927.

Mangathayee, Female Assistant Head Attendant, proceeded on 1st December, 1927, on 42 days' vacation leave and 2 months 18 days' half-pay leave.

Mahadeo, Assistant Head Attendant, proceeded to India on 15th December, 1927, on 42 days' vacation leave and 2 months and 18 days' half-pay leave.

Mrs. H. M. Josephs, Matron, proceeded to India on 15th December, 1927, on 42 days' vacation leave and three months' commuted full-pay leave.

Miss Tan Guat Beng, Probationer Nurse, sat for the Preliminary Examination of the Royal Medico-Psychological Association of Great Britain and Ireland on 2nd November, 1926, and 2nd May, 1927, and failed. She sat again on 22nd November, 1927, and the result is not yet known.

Miss Lee Dee Yin, Probationer Nurse, sat for the Preliminary Examination of the Royal Medico-Psychological Association of Great Britain and Ireland on 22nd November, 1927, the result is not yet known.

82. Miss Webb, on arrival in January, was sent to Batu Gajah Hospital as there was no accommodation for her here.

83. On the arrival of Mr. and Mrs. Young, Mr. Jones was transferred to the Cameron's Highlands. This transfer was, as far as I was concerned, made more to make room for Mr. and Mrs. Young, than anything else. Mr. Jones has not been replaced, and there has been no one to supervise the farms since he left.

84. Mrs. Young had nothing to do until Mrs. Josephs went on leave, when Mrs. Young took over from her to act.

85. Messrs. Young, Wimsey and Smith have been given a certain amount of work of supervision in sections of wards, so that they would not be completely idle.

86. *Attendants.*—We still suffer from a shortage of attendants, in spite of the fact that a slight improvement in the pay was made last May. All that can be said is that the shortage is not so acute as it was in 1926.

87. *Maintenance.*—The maintenance rate was \$193.72 against \$176.23 in 1926 and \$172.96 in 1925. The increase is almost altogether due to the cost of the First Class Ward, which, though not finished had to have its staff paid for, furniture bought, etc.

88. *Revenue.*—We collected in fees from Singapore, Kedah, Perlis and Kelantan and Federated Malay States paying patients \$106,015.87.

89. *Amusements.*—The usual games and sports were indulged in and in the majority of cases were appreciated.

90. The usual Sunday walks in the town were continued.

91. Fewer circuses and cinemas visited the village last year so that the patients had less outing, but we had a visit from a conjuror which was somewhat interfered with, owing to the poor lighting of the dining hall where the performance was held.

92. The time has come when a cinema of our own would be a great advantage. This would be only following the footsteps of the majority of British Mental Hospitals.

I have the honour to be,

Sir,

Your obedient servant,

W. F. SAMUELS,

*Medical Superintendent,*

*Central Mental Hospital, Tanjong Rambutan.*

TANJONG RAMBUTAN,  
30th January, 1928.

## SPECIFIC DISEASES WHICH CAUSED DEATH DURING 1927.

General paralysis of the insane	...	...	39
Dysentery	...	...	26 (omoebic dysentery 4)
Phthisis	...	...	24
Pneumonia	...	...	18 (influenzal pneumonia 9)
Cardio-vascular degeneration	...	...	14
Exhaustion from acute mania	...	...	8
Influenza	...	...	6
Nephritis	...	...	5
Malaria	...	...	6
Ankylostomiasis	...	...	3
Status epilepticus	...	...	5
Septicaemia	...	...	2
Cerebral meningitis	...	...	2
Syphilis	...	...	2
Rupture of spleens	...	...	2
Cerebral softening	...	...	2
Toxaemia following multiple abscessis	...	...	1
Fracture of base of skull	...	...	1
Gangrene of leg	...	...	1
Cerebral abscessis	...	...	1
Valvular diseases of heart	...	...	1
Obstructive jaundice	...	...	1
Fatty degeneration of heart	...	...	1
Abscess of lungs	...	...	1
Acute enteritis	...	...	1
Total	...	...	173

## THE DISTRICTS WHERE THE PATIENTS CAME FROM DURING 1927.

Kuala Lumpur	...	...	140	Lahat	...	...	2
Ipoh	...	...	94	Chemor	...	...	4
Taiping	...	...	67	Tanjong Tualang	...	...	1
Seremban	...	...	48	Tanjong Rambutan	...	...	5
Kuala Kangsar	...	...	35	Pondok Tanjong	...	...	1
Teluk Anson	...	...	37	Batu Arang	...	...	5
Batu Gajah	...	...	29	Malacca	...	...	1
Klang	...	...	32	Kuala Kurau	...	...	4
Kampar	...	...	14	Kuala Selangor	...	...	2
Tapah	...	...	18	Lenggong	...	...	3
Bentong	...	...	15	Lahat town	...	...	5
Sungei Siput	...	...	12	Rawang	...	...	3
Bagan Serai	...	...	14	Port Dickson	...	...	2
Parit Buntar	...	...	15	Tanjong Malim	...	...	7
Kuala Kubu	...	...	13	Ulu Selangor	...	...	2
Kuala Pilah	...	...	10	Siputeh	...	...	1
Kajang	...	...	9	Kuala Lipis	...	...	4
Kuala Lipis	...	...	11	Kuantan	...	...	3
Gemas	...	...	7	Padang Rengas	...	...	4
Sitiawan	...	...	8	Temerloh	...	...	2
Tampin	...	...	6	Temoh	...	...	3
Gopeng	...	...	6	Simpang Ampat	...	...	4
Sungei Besi	...	...	5	Enggor	...	...	1
Batu Tiga	...	...	2	Tronoh	...	...	1
Bidor	...	...	2	Port Swettenham	...	...	7
Mantin	...	...	4	Mentakab	...	...	2
Trong	...	...	4	Batu Caves	...	...	1
Tambun	...	...	2	Sabak Bernam	...	...	1
Papan	...	...	4	Selama	...	...	1
Klian Intan	...	...	3	Banir	...	...	2
Pusing	...	...	6	Jeram	...	...	1
Sungkai	...	...	1	Chegar Perah	...	...	1
Port Weld	...	...	1	Bukit Mertajam	...	...	1
Sungei Tempayan	...	...	2	Menglembu	...	...	3
Raub	...	...	3				
Bruas	...	...	1				
				Total	...	...	773



## FARM PRODUCE FOR 1927.

				\$	c.		\$	c.
Milk, fresh	...	...	13,218½ pints	at	20½ a pint	=	2,709	79
Pork	...	...	5,868.12 katis	,,	46 a kati	=	2,699	63
Fowl	...	...	45.04 ,,	,,	85 ,,	=	38	46
Eggs, hen	...	...	165.00 ,,	,,	4½ each	=	7	43
Curry-stuff	...	...	36.08 ,,	,,	22 a kati	=	8	03
Dholl	...	...	282.00 ,,	,,	8 ,,	=	22	56
Peas, green	...	...	130.00 ,,	,,	8 ,,	=	10	40
Oil, kachang	...	...	14.08 ,,	,,	40 ,,	=	5	80
Oil cake	...	...	22.08 ,,	,,	8 ,,	=	1	80
Millet	...	...	292.00 ,,	,,	8 ,,	=	23	36
Coffee	...	...	75.06 ,,	,,	70 ,,	=	52	76
Indian corn	...	...	204.00 ,,	,,	8 ,,	=	16	32
Sweet potatoes	...	...	4,472.00 ,,	,,	2 ,,	=	89	44
Tapioca	...	...	56.00 ,,	,,	2 ,,	=	1	12
Cocoanuts	...	...	3,324.00 ,,	,,	5 each	=	166	20
Cigars	...	...	5,400.	,,	½ ,,	=	27	00
Arrowroot	...	...	51.08 katis	,,	80 a kati	=	41	20
Yam	...	...	1,168.00 ,,	,,	8 ,,	=	93	44
Sugar cane	...	...	16,595.00 ,,	,,	1 ,,	=	165	95
Limes	...	...	1,623	,,	2 each	=	32	46
Citron	...	...	2	,,	3 ,,	=		06
Bullock's heart	...	...	92	,,	5 ,,	=	4	60
Buah susu	...	...	10	,,	3 ,,	=		30
Soursop	...	...	580	,,	8 ,,	=	46	40
Belimbings	...	...	54,552	,,	¼ ,,	=	136	38
Carombollas	...	...	650	,,	¼ ,,	=	1	63
Papayas	...	...	4,281	,,	4 ,,	=	171	24
Bananas	...	...	533 bunches	,,	1.50 ,,	=	799	50
Pineapples	...	...	1,765	,,	10 ,,	=	176	50
Guava	...	...	11,137	,,	½ ,,	=	55	69
Jack fruit	...	...	167	,,	50 ,,	=	83	50
Cashew	...	...	72	,,	½ ,,	=		36
Cocoplum	...	...	5,859	,,	½ ,,	=	29	30
Pitanji	...	...	7,761	,,	½ ,,	=	38	81
Chikus	...	...	2,594	,,	⅔ ,,	=	77	82
Otaheitic chestnuts	...	...	306	,,	1 ,,	=	3	06
Oranges	...	...	932	,,	6 ,,	=	55	92
Pomeloes	...	...	6	,,	20 ,,	=	1	20
Buah bunga tanjong	...	...	657	,,	⅓ ,,	=		82
Custard apples	...	...	3,443	,,	5 ,,	=	172	15
Rambutans	...	...	547	,,	¼ ,,	=	1	37
Mangoes	...	...	613	,,	15 ,,	=	91	95
Mangoes (ordinary)	...	...	5,700	,,	1 ,,	=	57	00
Machang	...	...	2	,,	1 ,,	=		02
Mulberry	...	...	14.07 katis	,,	25 a kati	=	3	61
Avocado pear	...	...	42	,,	8 each	=	3	36
Vegetables	...	...	315,527.04 katis	,,	8¼ a kati	=	26,031	00

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 Total = 34,256 70

 Firewood to kitchen, disinfectors, infectious diseases, hospital, dhoby  
 sheds, kiln, farms, etc. :

Two thousand one hundred and ninety cart loads at \$12 a cart = 26,280 00

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 Grand Total ... \$60,536 70
 

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*Building during 1927.—*

									\$	c.
Incinerator, new	...	...	...	...	...	...	...	...	174	82
Horton farm, new	...	...	...	...	...	...	...	...	254	40
Highfield farm re-thatching	...	...	...	...	...	...	...	...	80	48
Cattle shed for Hillside farm, new	...	...	...	...	...	...	...	...	730	72
Woodside farm re-thatching	...	...	...	...	...	...	...	...	107	32
Cattleshed farm, new	...	...	...	...	...	...	...	...	723	08
Cement concrete drain in front of A line	...	...	...	...	...	...	...	...	262	50
Sungei Bulat deviations earthwork	...	...	...	...	...	...	...	...	620	55
Leigh farm, new	...	...	...	...	...	...	...	...	466	28
Kiln and shed, new	...	...	...	...	...	...	...	...	1,013	56
Cement concrete in front of kitchen	...	...	...	...	...	...	...	...	56	10
Farm No. 15, new	...	...	...	...	...	...	...	...	580	22
Richmond farm store, new	...	...	...	...	...	...	...	...	86	25
Moulton farm sub-soil drain	...	...	...	...	...	...	...	...	335	50
Leigh farm sub-soil drain	...	...	...	...	...	...	...	...	326	40
Sungei Bulat sub-soil drain	...	...	...	...	...	...	...	...	627	50
Horton farm sub-soil drain	...	...	...	...	...	...	...	...	150	95
Fish pond sub-soil drain	...	...	...	...	...	...	...	...	202	05
Sungei Bulat No. 1	...	...	...	...	...	...	...	...	5,410	69
„ No. 2	...	...	...	...	...	...	...	...	975	60
„ No. 3	...	...	...	...	...	...	...	...	2,131	11
Dust-bin, front gate	...	...	...	...	...	...	...	...	67	15
Dust-bin, R line	...	...	...	...	...	...	...	...	159	63
Sub-soil drain between boundary fence and railway line	...	...	...	...	...	...	...	...	397	50
Latrine behind workshop	...	...	...	...	...	...	...	...	68	66
Ward No. 6 fixing iron fence	...	...	...	...	...	...	...	...	30	75
Sungei Bulat No. 4	...	...	...	...	...	...	...	...	1,102	60
Total	...	...	...	...	...	...	...	...	\$17,142	37

*Bamboo works during 1927.—*

<i>Bamboo works during 1927.—</i>							\$	c.	\$	c.	
1.	Brooms, bamboo	...	...	...	...	6,147	at	30	=	1,844	10
2.	Chinese hats	...	...	...	...	468	„	60	=	280	80
3.	Baskets, carrying vegetables	...	...	...	...	42	„	1 00	=	42	00
4.	„ boiling fish	...	...	...	...	40	„	90	=	36	00
5.	„ washing rice	...	...	...	...	38	„	1 00	=	38	00
6.	„ shovels	...	...	...	...	1,045	„	25	=	261	25

*Tailoring.—*

1. Bajus, female patients	...	...	...	...	4,518	„	25	=	1,144	50
2. Sarongs, female patients	...	...	...	...	3,553	„	25	=	888	25
3. Bajus, male patients	...	...	...	...	7,450	„	25	=	1,862	50
4. Trousers, male patients	...	...	...	...	6,322	„	25	=	1,580	50
5. Shorts, male attendants	...	...	...	...	262	„	50	=	131	00
6. Shirts, male attendants	...	...	...	...	253	„	50	=	126	50
7. Kabayahs, female attendants	...	...	...	...	85	„	75	=	60	75
8. Sarongs, female attendants	...	...	...	...	68	„	75	=	51	00
9. Mosquito curtains	...	...	...	...	276	„	50	=	138	00
10. Canvas campcot covers	...	...	...	...	10	„	1 00	=	10	00
11. Lock suits, canvas	...	...	...	...	5	„	1 50	=	7	50
12. Pillows, coir	...	...	...	...	949	„	15	=	142	35
13. Pillow cases	...	...	...	...	2,014	„	15	=	302	10
14. Motor bus cushion covers, cloth	...	...	...	...	9	„	50	=	4	50
15. Stretcher covers, canvas	...	...	...	...	5	„	1 50	=	7	50

*Carpentering.—*

1. Bathing tins	...	...	...	...	187	„	20	=	37	40
2. Basket with covers	...	...	...	...	19	„	25	=	4	50
3. Baskets, carrying grass	...	...	...	...	54	„	50	=	27	00
4. Qualley covers, wooden	...	...	...	...	18	„	25	=	4	50
5. Sand boxes, wooden	...	...	...	...	52	„	20	=	10	40
6. Tin scoops	...	...	...	...	54	„	20	=	10	80
7. Trays for feeding pigs	...	...	...	...	47	„	50	=	23	50
8. Meals trays	...	...	...	...	30	„	1 00	=	30	00
9. Meal tray with covers	...	...	...	...	43	„	1 00	=	43	00
10. Inverts moulds, wooden	...	...	...	...	12	„	4 00	=	48	00
11. Dressing boxes	...	...	...	...	12	„	1 00	=	12	00
12. Wooden ladder	...	...	...	...	1	„	5 00	=	5	00
13. Soil linen basket, rattan	...	...	...	...	3	„	3 00	=	9	00
14. Trays for carrying vegetables, wooden	...	...	...	...	2	„	2 00	=	4	00
15. Wooden box, large	...	...	...	...	2	„	4 00	=	8	00
Total	...	...	...	...					9,269	65



								\$	c.	\$	c.
<i>Mending during 1927.—</i>											
Bajus	...	...	...	...	...	...	...	5,860	at	05	= 293 00
Sarongs	...	...	...	...	...	...	...	5,410	„	10	= 541 00
White blankets	...	...	...	...	...	...	...	293	„	10	= 29 30
Red blankets	...	...	...	...	...	...	...	145	„	10	= 14 50
Pillow cases	...	...	...	...	...	...	...	624	„	03	= 18 72
Pillows, coir	...	...	...	...	...	...	...	96	„	03	= 2 88
Curtains	...	...	...	...	...	...	...	13	„	25	= 3 25
Kebayahs	...	...	...	...	...	...	...	86	„	10	= 8 60
Sarong attendants	...	...	...	...	...	...	...	20	„	10	= 2 00
Red belts	...	...	...	...	...	...	...	41	„	05	= 2 05

*Repairing during 1927.—*

Repairs to sledges	...	...	...	...	...	...	...	8	„	5 00	= 40 00
„ dining tables	...	...	...	...	...	...	...	19	„	7 00	= 133 00
„ bedboards	...	...	...	...	...	...	...	202	„	1 00	= 202 00
„ meal trays	...	...	...	...	...	...	...	130	„	50	= 65 00
„ trolleys	...	...	...	...	...	...	...	48	„	2 00	= 96 00
„ dining benches	...	...	...	...	...	...	...	207	„	70	= 144 90
„ hand carts	...	...	...	...	...	...	...	11	„	4 00	= 44 00
„ wheel barrows	...	...	...	...	...	...	...	15	„	2 00	= 30 00
„ bullock-carts	...	...	...	...	...	...	...	5	„	5 00	= 25 00
„ meal carrier frames	...	...	...	...	...	...	...	9	„	1 00	= 9 00
„ covers to manure well	...	...	...	...	...	...	...	5	„	6 00	= 30 00
„ ladders	...	...	...	...	...	...	...	4	„	1 00	= 4 00
„ screens	...	...	...	...	...	...	...	3	„	2 00	= 6 00
„ covers to tea tubs	...	...	...	...	...	...	...	10	„	50	= 5 00
„ farm sign boards	...	...	...	...	...	...	...	32	„	50	= 16 00
„ chairs	...	...	...	...	...	...	...	17	„	50	= 8 50

Total ... 1,775 70

*Miscellaneous.—*

								\$	c.	\$	c.
Coffins	...	...	...	...	...	...	...	124	at	2 00	= 248 00
Tombstones	...	...	...	...	...	...	...	124	„	25	= 31 00
Boxes for conveying Wassermann specimen	...	...	...	...	...	...	...	4	„	50	= 2 00
Doors to the store	...	...	...	...	...	...	...	6	„	1 00	= 6 00
Lids to refuse bins	...	...	...	...	...	...	...	3	„	1 00	= 3 00
Replacing 47 tombstones	...	...	...	...	...	...	...	47	„	25	= 11 75
Hockey goal posts	...	...	...	...	...	...	...	2	„	5 00	= 10 00
Box to keep fire extinguishers	...	...	...	...	...	...	...	4	„	1 00	= 4 00
Sign boards	...	...	...	...	...	...	...	6	„	1 00	= 6 00
Sand boxes	...	...	...	...	...	...	...	100	„	30	= 3 00
Sign board posts	...	...	...	...	...	...	...	2	„	10 00	= 20 00

*Daily works.—*

Laying out, weeding and clearing land for planting food-stuffs.  
 Drain cleaning and scavenging.  
 Sweeping and cleaning grass and lalang.  
 Carting firewood and rubbish.  
 Gardening.  
 Repairing and planting bamboo and “bunga raya” fence.  
 Clearing roads and paths and weeding in fields and farms.  
 Boundary clearing.  
 Scything and rolling padang.  
 Woodcutting.  
 Clearing overgrowths on sides of drains and along pipe line.  
 Filling and levelling up holes and swamps.  
 Repairing roads and paths.  
 Collecting fuel for kiln and farms.  
 Making clay pipes and cement inverts.  
 Repairing and thatching farm houses.  
 Mowing by machine.  
 Working at Sungei Bulat, laying inverts and sub-soil pipes.  
 Ploughing by motor tractor.

TABLE A.  
GENERAL TABLE SHOWING THE MOVEMENT OF THE HOSPITAL POPULATION  
DURING THE YEAR 1927.

	Certified patients.					
	M.	F.	Total.	M.	F.	Total.
On the hospital register, January 1st, 1927 ...	1,550	471	2,021			
Total cases admitted during the year ...	696	204	900			
Total cases under treatment during the year ...	2,246	675	2,921			
Cases discharged or transferred during the year—						
Recovered ...	...	...	...	239	64	303
Relieved ...	...	...	...	69	17	86
Not improved ...	...	...	...	50	19	69
Not insane ...	...	...	...	1	...	1
Died during the year ...	...	...	...	120	53	173
Absconded ...	...	...	...	68	1	69
Total cases discharged, transferred and died during the year...	547	154	701	547	154	701
On the hospital register on December 31st, 1927	1,699	521	2,220			
Daily average number on the register during the year ...	...	...	...	2,110		

TABLE B.  
SHOWING THE FORM OF THE MENTAL DISORDER ON ADMISSION IN THE DIRECT  
ADMISSIONS DURING THE YEAR 1927.

Forms of mental disorder.			Direct admission.		
			M.	F.	Total.
Congenital or infantile mental deficiency (idiocy or imbecility) occurring as early in life as it can be observed.	1. Intellectual—				
	(a) With epilepsy ...	...	3	2	5
	(b) Without epilepsy ...	...	8	8	16
Insanity occurring later in life.	2. Moral				
	1. Insanity with epilepsy ...	...	16	8	24
	2. General paralysis of the insane ...	...	30	5	35
	3. Insanity with grosser brain lesions ...	...	...	2	2
	4. Acute delirium				
	5. Confusional insanity ...	...	59	22	81
	6. Stupor ...	...	2	2	4
	7. Primary dementia ...	...	244	42	286
	8. Mania—				
	(a) Recent ...	...	68	30	98
	(b) Chronic				
	(c) Recurrent ...	...	7	11	18
	9. Melancholia—				
	(a) Recent ...	...	92	50	142
	(b) Chronic				
	(c) Recurrent				
	10. Alternating insanity ...	...	16	...	16
	11. Delusional insanity—				
	(a) Systematised ...	...	3	...	3
	(b) Non-systematised ...	...	10	...	10
	12. Volitional insanity—				
	(a) Impulse				
	(b) Obsession				
	(c) Doubt				
	13. Moral insanity				
	14. Dementia—				
	(a) Senile ...	...	23	5	28
	(b) Secondary ...	...	3	1	4
	15. Not Insane ...	...	1	...	1
	Total ...		585	188	773



PATIENTS DISCHARGED AS CURED DURING THE YEAR 1927.

Form of mental disorder.				M.	F.	Total.
Congenital or infantile mental deficiency (idiocy or imbecility) as occurring as early in life as it can be observed.	{	1. Intellectual—				
		(a) With epilepsy				
		(b) Without epilepsy				
		2. Moral				
Insanity occurring later in life.	{	1. Insanity with epilepsy ... ..		2	...	2
		2. General paralysis of the insane				
		3. Insanity with grosser brain lesions				
		4. Acute delirium				
		5. Confusional insanity ... ..		47	6	53
		6. Stupor				
		7. Primary dementia ... ..		63	9	72
		8. Mania—				
		(a) Recent ... ..		37	17	54
		(b) Chronic				
		(c) Recurrent ... ..		5	7	12
		9. Melancholia—				
		(a) Recent ... ..		47	23	70
		(b) Chronic				
		(c) Recurrent ... ..		6	2	8
		10. Alternating insanity ... ..		9	...	9
		11. Delusional insanity—				
		(a) Systematised				
		(b) Non-systematised ... ..		12	...	12
		12. Volitional insanity—				
		(a) Impulse				
		(b) Obsession				
		(c) Doubt				
		13. Moral insanity				
		14. Dementia—				
		(a) Senile				
		(b) Secondary				
		15. Not insane				
Total ...				228	64	292

AN ANALYSE OF THE DISCHARGES AND TRANSFERS DURING THE YEAR 1927.

	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.
Discharges as recovered from—									
Direct admissions ... ..									
First attack cases ... ..	84	31	115						
Not first attack cases ... ..	37	16	53						
Cases unknown whether first attack or not	107	17	124						
Total from direct admissions ... ..	228	64	292						
From transfers—									
First attack cases ... ..	3	...	3						
Not first attack cases ... ..	2	1	3						
Cases unknown whether first attack or not	5	...	5						
Total from transfers ... ..	10	1	11						
Total discharges as recovered ... ..	...	...	...	238	65	303			
				Relieved.			Not improved.		
Discharges (not recovered) as—									
Relieved ... ..	...	...	...	60	18	78			
Not improved ... ..	...	...	...	49	17	66	49	17	66
Total ... ..	...	...	...	109	35	144			
Reasons for such discharges—									
To go to care of friends ... ..	109	35	144						
Statutory by irregularity in reception order									
Other reasons (specifying them)—									
Total ... ..									
Transferred as—									
Relieved ... ..									
Not improved ... ..									
Total ... ..									
Destination of such transfers—									
To leper asylum ... ..	1	...	1						
To single care ... ..									
Other destination (specifying such)—									
Total ... ..									
Total discharges and transfers as—									
Relieved ... ..									
Not improved ... ..	1	...	1						



TABLE SHOWING THE FORM OF MENTAL DISORDER ON 31ST DECEMBER, 1927,  
OF THOSE ON THE REGISTER AT THAT DATE.

Forms of mental disorder on 31st December.				M.	F.	Total.
Congenital or infantile mental deficiency (idiocy or imbecility) as occurring as early in life as it can be observed.	1. Intellectual—					
	(a) With epilepsy ... ..			7	5	12
	(b) Without epilepsy ... ..			44	21	65
Insanity occurring later in life.	2. Moral					
	1. Insanity with epilepsy ... ..			65	22	87
	2. General paralysis of the insane ...			49	5	54
	3. Insanity with grosser brain lesions ...			11	4	15
	4. Acute delirium ... ..					
	5. Confusional insanity ... ..			41	13	54
	6. Stupor ... ..			5	3	8
	7. Primary dementia ... ..			543	97	640
	8. Mania—					
	(a) Recent ... ..			38	22	60
	(b) Chronic ... ..			27	4	31
	(c) Recurrent ... ..			12	11	23
	9. Melancholia—					
	(a) Recent ... ..			59	39	98
	(b) Chronic ... ..			67	14	81
	(c) Recurrent ... ..			9	1	10
	10. Alternating insanity ... ..			35	1	36
	11. Delusional insanity—					
	(a) Systematised ... ..			31	3	34
	(b) Non-systematised ... ..			26	3	29
	12. Volitional insanity—					
	(a) Impulse ... ..			2	...	2
	(b) Obsession ... ..					
	(c) Doubt ... ..			1	...	1
	13. Moral insanity ... ..					
	14. Dementia—					
	(a) Senile ... ..			75	16	91
	(b) Secondary ... ..			551	237	788
	15. Not insane ... ..			1	...	1
	Total ...			1,699	521	2,220

Favourable 340  
Doubtful 166  
Unfavourable 1,714

TABLE SHOWING THE FORM OF MENTAL DISORDER AND NATIONALITY ON ADMISSION  
IN THE DIRECT ADMISSION DURING THE YEAR 1927.

Forms of mental disorder.		Males.						Females.						Total.		
		Chinese.	Malays.	Tamils.	Javanese.	Eurasians.	Others.	Chinese.	Malays.	Tamils.	Javanese.	Eurasians.	Others.	Males.	Females.	Total.
Congenital or infantile mental deficiency (idiocy or imbecility) occurring as early in life as it can be observed.	1. Intellectual—															
	(a) With epilepsy	2	...	1	...	...	...	1	...	1	...	...	...	3	2	5
	(b) Without epilepsy	5	2	1	...	...	...	7	...	1	...	...	...	8	8	16
Insanity occurring later in life.	Insanity with epilepsy	8	1	6	1	...	...	3	...	4	...	...	1	16	8	24
	General paralysis of the insane	28	1	...	...	...	1	5	...	...	...	...	...	30	5	35
	Insanity with grosser brain lesion	...	...	...	...	...	...	1	...	1	...	...	...	...	2	2
	Acute delirium															
	Confusional insanity	26	4	29	...	...	...	9	1	12	...	...	...	59	22	81
	Stupor	1	1	...	...	...	...	...	1	1	...	...	...	2	2	4
	Primary dementia	135	34	66	6	1	2	15	11	14	1	...	1	244	42	286
	Mania—															
	(a) Recent	35	8	24	...	...	1	15	2	11	2	...	...	68	30	98
	(b) Recurrent	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	(c) Chronic	1	1	4	...	...	1	5	5	1	...	...	...	7	11	18
	Melancholia—															
	(a) Recent	35	7	44	1	...	5	20	...	29	...	...	1	92	50	142
	(b) Recurrent	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	(c) Chronic	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Alternating insanity	9	2	5	...	...	...	...	...	...	...	...	...	16	...	16
	Delusional insanity—															
	(a) Systematised	2	...	1	...	...	...	...	...	...	...	...	...	3	...	3
	(b) Non-systematised	3	1	6	...	...	...	...	...	...	...	...	...	10	...	10
	Volitional insanity—															
	(a) Impulse	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	(b) Obsession	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	(c) Doubt	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Moral insanity	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Dementia—															
	(a) Senile	17	4	1	1	...	...	3	...	1	...	...	1	23	5	28
	(b) Secondary	3	...	...	...	...	...	...	1	...	...	...	...	3	1	4
	Not insane	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1
	Totals	311	66	188	9	1	10	84	21	76	3	...	4	585	188	773

ANALYSES OF THE ADMISSIONS DURING THE YEAR 1927.

Classes of admissions.	Congenital.			Acquired.									Total.		
				First attack.			Not first attack.			Unknown whether first attack or not.					
	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.
Direct ... ..	...	2	2	148	53	201	94	32	126	343	101	444	585	188	773
Total admissions ... ..	...	2	2	148	53	201	94	32	126	343	101	444	585	188	773



AGES.

Civil year.	Less than 10 years of age.		10-14		15-19		20-24		25-29		30-34		35-39		40-44		45-49		50-54		55-59		60-64		65-69		70-74		75-79		80-84		Totals.															
	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.	M.	F.	Total.															
1927	...	...	...	6	7	13	26	15	41	70	19	89	100	35	135	135	46	181	82	49	6	55	23	3	26	14	3	17	11	3	14	4	...	4	...	...	...	...	1	...	1	585	188	773				
1926	...	1	1	4	4	8	20	6	26	41	15	56	99	32	131	69	34	103	76	38	10	48	18	5	23	16	4	20	10	5	15	6	...	6	2	1	3	...	...	1	...	1	489	155	644			
1925	...	1	1	2	5	3	8	18	4	22	41	14	55	61	20	81	90	34	124	80	20	100	64	15	79	40	8	48	28	5	33	9	5	14	8	4	12	1	4	5	1	...	1	...	1	448	138	586
1924	...	2	...	2	1	1	2	12	9	21	45	13	58	75	14	89	75	25	100	70	16	86	61	12	73	30	8	38	26	3	29	8	...	8	11	2	13	3	...	3	...	...	...	...	...	416	106	522
1923	...	1	...	1	3	2	5	15	7	22	35	12	47	50	16	66	66	25	91	70	19	89	44	9	53	11	7	18	11	6	17	5	...	5	4	...	4	1	1	2	1	...	1	...	1	318	104	422







AETIOLOGICAL, SHOWING THE AETIOLOGICAL FACTORS AND ASSOCIATED CONDITIONS ASSIGNED IN THE DIRECT ADMISSIONS DURING THE YEAR 1927  
 DISTINGUISHED BETWEEN CASES CONGENITAL, FIRST ATTACK, NOT FIRST ATTACK AND UNKNOWN WHETHER FIRST ATTACK OR NOT—(cont.).

Aetiological factors and associated conditions.	(5) Cases unknown whether first attack or not.					(6) Total direct admissions.					Grand total incidence.		
	Principal.		Contributory.			Principal.		Contributory.					
	Instances where regarded as the essential or chief factor.	Total incidence.	Instances where regarded as a contributory or associated condition.	M.	F.	Total.	Instances where regarded as the essential or chief factor.	Total incidence.	Instances where regarded as a contributory or associated condition.	M.		F.	Total.
A. Hereditary (excluding cousins, nephew, nieces and offspring)—													
(1) Insane ... ..	1	2	...	...	1	1	6	10	3	7	6	13	
(2) Epileptic ... ..													
(3) Neurotic [including only hysteria, neurasthenia, spasmodic (idiopathic) asthma and chorea] ... ..													
(4) Eccentricity ... ..													
(5) Alcoholism ... ..													
B. Mental Instability, as revealed by—													
(1) Moral deficiency ... ..													
(2) Congenital mental defects not amounting to imbecility ... ..													
(3) Eccentricity ... ..													
C. Deprivation of Special Sense—													
(1) Smell or taste ... ..													
(2) Hearing ... ..													
(3) Sight ... ..													
D. Critical Periods—													
(1) Puberty and adolescence ... ..	10	13	6	5	15	19	5	28	6	29	6	35	
(2) Climacteric ... ..	15	16	10	8	23	26	3	30	9	36	7	43	
(3) Sensibility ... ..	9	11	1	1	10	12	6	18	1	13	6	19	
E. Child-bearing—													
(1) Pregnancy ... ..	...	...	...	...	...	...	1	1	...	...	2	2	
(2) Puerperal state (not septic) ... ..	...	...	2	...	...	2	1	1	...	...	3	3	
(3) Lactation ... ..	...	1	...	...	...	1	1	1	...	...	1	1	
F. Mental Stress—													
(1) Sudden ... ..	1	2	2	...	1	4	1	2	3	4	4	8	
(2) Prolonged ... ..	...	...	15	12	12	15	1	2	25	26	6	32	
G. Physiological Defects and Errors—													
(1) Malnutrition in early life (signs of rickets, etc.) ... ..													
(2) Privation and starvation ... ..	...	...	2	2	2	2	...	...	2	2	...	2	
(3) Over-exertion (physical) ... ..	2	2	...	...	2	2	...	2	...	2	...	2	
(4) Masturbation ... ..	...	...	...	...	...	...	...	...	...	...	1	1	
(5) Sexual excess... ..	...	...	...	...	...	...	...	...	...	...	...	...	
H. Toxic—													
(1) Alcohol ... ..	21	23	22	19	40	45	5	54	30	79	9	88	
(2) Drug habit (morphia, cocaine, etc.) ... ..													
(3) Lead and other such poisons ... ..													
(4) Tuberculosis ... ..													
(5) Influenza ... ..	11	11	3	3	14	14	...	16	5	21	...	21	



[illegible]

## APPENDIX J.

## ANNUAL REPORT ON THE WORK DONE IN COMBATING VENEREAL DISEASES IN THE FEDERATED MALAY STATES DURING THE YEAR 1927.

1. As in the previous years considerable progress has again been made in combating venereal diseases, new treatment centres have been opened, which are well attended, and there has been an increase of attendance at the old centres.

2. This satisfactory progress can be attributed to the propaganda which has been carried out, and to the careful selection and special training given to the staff who have been appointed to the different clinics.

3. The following table shows nationality, diseases and numbers treated in the Federated Malay States during the year 1926 and 1927, the total treated for 1927 is 25,744 as compared with 16,138 for 1926:

Nationality.	1926.					1927			
	Total No.	Syphilis.	Gonorrhea.	Soft sore.		Total No.	Syphilis.	Gonorrhea.	Soft sore.
Chinese ... ..	8,554	6,504	1,285	765	...	14,797	9,662	4,180	955
Tamils ... ..	4,877	2,502	1,607	768	...	6,931	3,838	2,364	729
Malays ... ..	1,497	980	435	82	...	2,122	1,433	610	79
Sikhs ... ..	597	363	175	59	...	1,017	657	286	74
Eurasians ... ..	107	46	52	9	...	136	50	82	4
Europeans ... ..	201	38	148	15	...	304	52	229	23
Others ... ..	305	175	104	26	...	437	248	166	23
Total ... ..	16,138	10,608	3,806	1,724	...	25,744	15,940	7,917	1,887

4. The following table shows numbers treated in each State during 1926 and 1927:

State.	1926.	1927.
Perak ... ..	6,788	8,420
Selangor ... ..	6,234	12,682
Negri Sembilan ... ..	2,469	3,910
Pahang ... ..	649	751
Total ... ..	16,138	25,744

It will be seen from the above table that there has been a great increase in the State of Selangor.

5. Graph No. 1 shows numbers treated in hospitals and clinics of the Federated Malay States during the last quarter 1925, the whole of 1926 and 1927.

6. During the year the following number of arsenical compounds were given:

Stabilarsan ... ..	23,599
Novarsenobillon ... ..	7,119
Sulphostab ... ..	455
Sulfarsonal ... ..	1,502
Total ... ..	32,675

The following are the figures for the different States:

States.	1927.
Perak ... ..	12,466
Selangor ... ..	14,315
Negri Sembilan ... ..	4,366
Pahang ... ..	1,528
Total ... ..	32,675

Bismostab has entirely taken the place of Mercury, 20,080 Bismostab injections were given.



## PROPAGANDA.

7. Education to the public as to the incidence and dangers of venereal diseases and the great importance of not contracting them, was carried out by means of lectures illustrated by lantern slides in the different towns and villages in the Federated Malay States, in addition to these lectures, pamphlets were distributed and posters exhibited in public places.

8. Education of the public is also continually being carried out in the various clinics, patients are made to understand the dangers of venereal diseases and the importance of early and continued treatment. The Clinic is not only a treatment centre but a centre for the education of the infected and of healthy persons.

9. At the Agricultural Show held in Kuala Lumpur during the month of August a portion of the space allotted to the Health Section was partitioned off for the venereal diseases propaganda, in this room a collection of photographs mostly taken from life showing the dangers of venereal diseases were exhibited with explanatory text in different languages and pamphlets also in different languages were distributed. Dressers who are attached to the venereal diseases staff were in constant attendance. This portion of the Health Section was very well attended by all nationalities, propaganda by this method has given satisfactory results. This is shown by an increased attendance at the clinic.

10. As in previous years professional education of Assistant Surgeons and Dressers has been carried out during the year, practically the whole of the subordinate staff received a course of instruction in venereal diseases, judging from the results of the recent examination this course proved useful.

## STAFF.

11. There has been an increase in the staff, three Assistant Surgeons have been appointed, making a total number of four, also a European Sister has been sent to the Female Section of the Sultan Street Clinic, Kuala Lumpur.

12. Carefully selected dressers from Kuala Kubu, Rasa, Sungei Besi, Telok Anson, Kampar, Taiping, Kuala Pilah, Tampin, Jelebu, Seremban, Kuala Lipis, Bentong and Temerloh have been sent to the Main Clinic, Sultan Street, Kuala Lumpur, for a course of training, the result has been most excellent, this is shown by an immediate increase in the number of patients attending the clinics.

## SELANGOR.

1. Table "A" shows numbers treated in the different hospitals and clinics during the year, it is noticed that there has been a great increase in the following places, Venereal Diseases Clinic, Sultan Street, Kuala Lumpur, Kuala Kubu and Serendah.

This is accounted for by the fact that carefully selected and specially trained dressers have been placed in charge of the above-mentioned places.

2. During the year, 12,682 patients of both sexes received treatment, showing an increase as compared with 6,234 in 1926.

The following table shows nationalities, diseases and numbers treated during 1926 and 1927:

Nationality.	1926.					1927.			
	Total No.	Syphilis.	Gonorrhea.	Soft sore.		Total No.	Syphilis.	Gonorrhea.	Soft sore.
Chinese ... ..	3,222	2,284	700	238	...	7,579	4,240	3,075	264
Tamils ... ..	1,945	950	758	237	...	3,284	1,796	1,200	288
Malays ... ..	411	263	133	15	...	777	535	209	33
Sikhs ... ..	282	173	91	18	...	508	322	164	22
Eurasians ... ..	70	26	37	7	...	85	28	56	1
Europeans ... ..	158	29	116	13	...	192	19	161	12
Others ... ..	146	68	66	12	...	238	127	100	11
Total ... ..	6,234	3,793	1,901	540	...	12,663	7,067	4,965	631

## MAIN TREATMENT CENTRES IN SELANGOR.

3. (A) *Venereal Diseases Treatment Centre, Sultan Street, Kuala Lumpur.*—The two shop houses in Sultan Street which have been rented since 1924 are still being used as the Town Dispensary and Venereal Diseases Treatment Centre. Graph No. 2 shows numbers treated since this clinic was opened, it will be seen that the largest number attended during the month of October, this has also been the case in previous years.

I am unable to account for this.

The following table shows nationality, diseases and number treated during 1926 and 1927:

and 1927:

		1926.				1927.					
Nationality.		Total No.	Syphilis.	Gonorrhea.	Soft sore.			Total No.	Syphilis.	Gonorrhea.	Soft sore.
Chinese	...	2,069	1,423	505	141	...	4,342	1,638	2,593	111	
Tamils	...	531	244	246	41	...	744	339	352	53	
Malays	...	171	108	59	4	...	240	167	66	7	
Sikhs	...	183	116	58	9	...	209	116	85	8	
Eurasians	...	48	16	26	6	...	68	25	43	—	
Europeans	...	152	26	113	13	...	181	18	153	10	
Others	...	68	29	29	10	...	105	65	32	8	
Total		3,222	1,962	1,036	224	...	5,889	2,368	3,324	197	

Two hundred and forty-eight patients attended for prophylactic treatment as compared with 87 in the previous year.

Table showing admissions during 1925, 1926 and 1927:

Nationality.	1925.	1926.	1927.
Chinese ... ..	1,496	2,069	4,342
Tamils ... ..	398	531	744
Malays ... ..	96	171	240
Sikhs ... ..	172	183	209
Eurasians ... ..	33	48	68
Europeans ... ..	84	152	181
Others ... ..	49	68	105
Total ... ..	2,328	3,222	5,889

It is encouraging to note the increasing attendance of Malays.

Out of the 5,889 patients treated 2,770 were females.

A record has been kept in the Sultan Street Clinic during the year showing number of male patients who came for treatment giving a history of having been under the influence of alcohol at the time of connection.

The following number shows nationality and number:

Nationality.	Total treated.	Alcohol.	Percentage of those under influence of alcohol.
Chinese ... ..	1,838	707	38.47
Tamils ... ..	667	342	51.27
Malays ... ..	141	21	14.89
Sikhs ... ..	180	83	46.11
Eurasians ... ..	52	21	40.38
Europeans ... ..	179	93	51.96
Others ... ..	62	15	24.19



The following table shows the different nationality and source of infection :

Nationality.	Chinese.		Japanese.	Malays.	Tamils.	Siamese.	Others.	Total.
	Prostitutes.	*Casual prostitutes.						
Chinese	770	910	47	77	2	31	1	1,838
Tamils	4	95	61	210	270	24	3	667
Malays	—	17	7	110	1	6	—	141
Sikhs	—	25	—	133	15	2	5	180
Eurasians	—	21	4	18	1	5	3	52
Europeans	—	23	15	99	22	11	9	179
Others	—	20	4	23	10	3	2	62
Total	774	1,111	138	670	341	82	23	3,119

Female Section, Sultan Street Treatment Centre, during the year 1927, 2,770 patients received treatment as compared with 627 in 1926, the following table shows nationalities, 1925, 1926 and 1927 :

Nationality.	1925.	1926.	1927.
Chinese	254	475	2,504
Tamils	37	64	77
Malays	17	51	99
Sikhs	12	15	29
Eurasians	3	12	16
Europeans	—	—	2
Others	13	10	43
Total	335	627	2,770

Return of nationalities and diseases for 1927, Sultan Street Female Centre :

Nationality.	Syphilis.	Gonorrhea.	Total.
Chinese	460	2,044	2,504
Tamils	61	16	77
Malays	93	6	99
Sikhs	23	6	29
Eurasians	11	5	16
Europeans	—	2	2
Others	39	4	43
Total	687	2,083	2,770

The following table shows number of prostitutes and others who attended for treatment during 1927 :

Prostitutes, examined	3,827
„ treated	1,913
V.D. cases not prostitutes	857
Other diseases	2,400
Irrigations	4,862
Stabilarsan injections	1,022
Bismostab injections	1,022
Sulphostab injections	36
Wassermann	241

There has been a regular attendance of the prostitutes from Kuala Lumpur, Sungei Besi, Kepong, Ampang, Rasa, Kuala Kubu and Rawang during the year, they all come of their own free will, and now fully recognise the importance of attending.

The nurse constantly gives instructions in general hygiene as well as venereal diseases.

*Ante-natal.*—Twenty-six women came for treatment; four mothers brought their babies regularly for examination.

Eighteen children ranging from the age of 1½ years to 10 years were brought by their mothers for treatment; of these nine were suffering from gonorrhoea and nine from syphilis.

\* Women who do not depend solely upon prostitution for their living.

(B) *District Hospital, Kuala Lumpur, Venereal Diseases Treatment Centre.*—During the period under review 1,363 patients of both sexes indoor and outdoor received treatment. The following table shows nationality and diseases:

Nationality.	Syphilis.	Gonorrhea.	Soft sore.	Total No.
Chinese ...	274	76	32	382
Tamils ...	433	264	75	772
Malays ...	81	32	2	115
Sikhs ...	24	14	1	39
Eurasians ...	2	9	1	12
Others ...	24	18	1	43
Total ...	838	413	112	1,363

The following table shows numbers that attended for indoor and outdoor treatment during 1925, 1926 and 1927:

	1925.		1926.		1927.	
	Males.	Females.	Males.	Females.	Males.	Females.
Indoor ...	912	12	936	120	946	105
Outdoor ...	323	34	226	132	274	38
Total ...	1,235	46	1,162	252	1,220	143

There has been a decrease in the number of females attending for outdoor treatment; this can be accounted for by the fact that they now attend the Female Clinic, Sultan Street.

*Arsenical Dermatitis.*—Twenty-one patients received treatment in the Venereal Diseases Wards, District Hospital, during the year, pruritis was a marked feature in all cases, oedema present in fourteen, there were four deaths, two Tamils and two Chinese, cause of death septic absorption, pneumonia, acute bacillary dysentery, acute nephritis.

Of the twenty-one cases, eleven were Tamils, eight Chinese, one Punjabi and one Malay; fifteen were treated with sodium theosulphate (Theostab—Boots—Ametox May and Baker) the remaining six with contramine.

*Gonococcal Arthritis.*—Twenty-four patients received treatment in the Venereal Diseases Wards, District Hospital, during the year, satisfactory results were obtained with contramine and sulphostab, theohistamine and sulfarsonal were also used but did not give such satisfactory results as the two previous drugs.

*Epididymitis.*—Twenty-six patients received treatment in the Venereal Diseases Wards, District Hospital, during the year, of these 19 were treated with sulfarsonal with the usual good results, six were treated with sulphostab, good results were also obtained, sulphostab has the advantage of being less painful than sulfarsonal, two cases received treatment with Gonococcus Immunogen (Parke Davis) with disappointing results.

*Noma Pudenda (Spirochaetal Gangrene).*—Two female patients received treatment in the Female Wards, District Hospital, during the year, both being Tamils.

*Laboratory Report.*—Smears showed spirochaetes, fusiform bacille and gram positive and gram negative organisms.

*Treatment.*—All gangrenous tissue cut away and two hourly dressing with Hydrogen Peroxide and dusting with Bismuth Fomric Iodide.

Both cases recovered.

*Buboes.*—One hundred and forty-one patients received treatment in the Venereal Diseases Wards, District Hospital, during the year, of these 103 were hard, they were treated with daily applications of pure Ichthyol spread on a thin layer of cotton wool, 77 out of 103 subsided by this treatment, average number of days for the buboes to subside = 12.



A careful record since July has been kept in the Venereal Diseases Wards, District Hospital, to find out if the patients receiving Bismuth developed a blue line on their gums during treatment, it will be seen by the following table that quite a large number of patients especially Tamils already have a blue line present before treatment and that Chinese suffer more from pyorrhoea than other nationalities. No cases suffered from stomatitis:

Nationality.					Blue line noticed before treatment.	Blue line appeared during treatment.	Pyorrhoea.		
Chinese	...	...	...	...	26	7	...	24	
Tamils	...	...	...	...	43	4	...	14	
Malays	...	...	...	...	19	2	...	14	
Sikhs	...	...	...	...	3	1	...	3	
Others	...	...	...	...	1	—	...	—	
Total					92	14	...	52	

*Balanitis Gangrenosa.*—Two patients received treatment during the year in the Venereal Diseases Wards, District Hospital, both made rapid recovery under treatment with frequent dressing of Hydrogen Peroxide and dusting with Bismuth Formic Iodide.

*Haemorrhagic Encephalitis.*—Two patients received treatment in the Venereal Diseases Wards, District Hospital, during the year, one died and the other, a male Tamil recovered, he suffered immediately after from Arsenical Dermatitis. Kodian, male Tamil, aged 35 years, occupation estate cooly, admitted into District Hospital, Kuala Lumpur, suffering from a sore on the penis, duration some time, both blood and cerebro spinal fluid gave positive reactions to the Wassermann test.

He was placed on a course of treatment consisting of Sulphostab .45 grams and Bismostab 1 c.c. given at weekly intervals, in the early morning, one week after the last injection, viz., the 3rd, he was found lying in bed unconscious, there were occasional convulsive twitchings of face, upper and lower limbs, head retracted, pupils slightly dilated, reacting sluggishly to light, Kernig's sign absent, knee jerks active, slight dyspnoea no cyanosis or oedema of face, pulse 108, volume and tension full, temperature 4 p.m. 101°, normal next morning.

The following treatment was immediately carried out.

Lumber puncture 10 c.c. of cerebro spinal fluid withdrawn, this was under pressure and slightly bloodstained.

Venesection 20 ounces, adrenalin 1 c.c. in 5 c.c. saline injected repeatedly. After a restless night, patient regained consciousness next morning, he made satisfactory progress during the day, and on the following day, it was possible to question him, he had no recollection of what happened immediately before he became unconscious, gave no history of headaches, and now only complained of dyspnoea, it was now noticed that the patient had a faintly marked erythematous rash on the abdomen and chest, in a few days this became more pronounced and rapidly became generalised with pruritis.

In a few days patient's skin became much worse, he rapidly reached a condition of generalised exfoliation with very marked pruritis and oedema. Sodium Theosulphate in the form of Theostab .45 grams had been administered immediately the erythema was noticed, this was continued until six injections had been given, the skin condition gradually cleared but the pruritis remained for some time causing the patient considerable discomfort.

Ultimately the patient was discharged his skin having completely cleared up, just previous to this, his blood and cerebro spinal fluid were examined, both gave a negative result to the Wassermann test. During the whole time the patient was in hospital he never passed less than 38 ounces of urine in the 24 hours; albumen was never found to be present. Frequent examinations of blood and stools revealed nothing.

#### FEDERAL HOME FOR WOMEN AND CHILDREN, KUALA LUMPUR.

I paid 57 visits to the above home. During the year 53 patients received treatment in the Venereal Diseases Clinic as compared with 73 for 1926.

## RECORD OF WORK.

Novarsenobillon injections	...	...	...	...	...	38
Stabilarsan injections	...	...	...	...	...	107
Sulphostab injections	...	...	...	...	...	6
Bismostab injections	...	...	...	...	...	150
Wassermann	...	...	...	...	...	43
Examination of microscopic slides	...	...	...	...	...	2,065

(C) *Klang Treatment Centre*.—During the year 1,400 patients of both sexes received treatment as compared with 463 during 1926 showing an increase of about a thousand.

The following table shows nationalities and diseases for 1926 and 1927:

Nationality.	1926.					1927.				
	Total No.	Syphilis.	Gonorrhea.	Soft sore.		Total No.	Syphilis.	Gonorrhea.	Soft sore.	
Chinese ... ..	169	113	38	18	...	650	489	138	23	...
Tamils ... ..	236	35	110	41	...	567	334	199	34	...
Malays ... ..	24	11	9	4	...	78	31	42	5	...
Sikhs ... ..	21	7	10	4	...	47	19	23	5	...
Eurasians ... ..	3	1	1	1	...	—	—	—	—	...
Europeans ... ..	—	—	—	—	...	2	—	2	—	...
Others ... ..	10	2	8	—	...	56	17	38	1	...
Total ... ..	463	219	176	68	..	1,400	890	442	68	...

## PERAK.

Table "A" shows numbers treated in the different hospitals and clinics during the year, it is noticed that there has been an increase in the following places, Ipoh, Kuala Kangsar and Tapah. During the year 8,420 patients of both sexes received treatment showing an increase as compared with 6,788 in 1926.

The following table shows nationalities and diseases treated during 1926 and 1927:

Nationality.	1926.					1927.				
	Total No.	Syphilis.	Gonorrhea.	Soft sore.		Total No.	Syphilis.	Gonorrhea.	Soft sore.	
Chinese ... ..	3,582	2,823	369	390	...	4,886	3,657	669	560	...
Tamils ... ..	2,121	1,116	616	389	...	2,347	1,342	682	323	...
Malays ... ..	817	583	180	54	...	744	558	155	31	...
Sikhs ... ..	187	129	40	18	...	336	212	82	42	...
Eurasians ... ..	6	1	5	—	...	16	6	9	1	...
Europeans ... ..	12	2	10	—	...	14	8	6	—	...
Others ... ..	63	44	15	4	...	77	47	25	5	...
Total ... ..	6,788	4,698	1,235	855	...	8,420	5,830	1,628	962	...

*Ipoh*.—Alterations necessary to convert the old Infant Welfare Centre into a venereal diseases clinic were completed towards the end of 1926. It was not possible to open this clinic before July on account of shortage of staff, and also no quarters were available, this clinic has proved an immense success, credit is due to the staff, Assistant Surgeon Mr. R. S. Dhillon and dressers S. Karthigasu and Chew Yiew Leong, before taking over the clinic they received a course of training in the venereal diseases wards, District Hospital, and the Sultan Street Clinic, Kuala Lumpur.

Since July, 1927, 1,839 patients have come for treatment.



The following table shows nationality and diseases from July, 1927:

July to December, 1927.								
Nationality.	Total No.		Syphilis.		Gonorrhea.		Soft sore.	
Chinese	...	1,296	...	982	...	200	...	114
Tamils	...	240	...	159	...	65	...	16
Malays	...	91	...	73	...	16	...	2
Sikhs	...	162	...	98	...	43	...	21
Eurasians	...	9	...	2	...	6	...	1
Europeans	...	3	...	2	...	1	...	—
Others	...	38	...	24	...	13	...	1
Total	...	1,839	...	1,340	...	344	...	155

*Kuala Kangsar.*—The satisfactory increase is due to the excellent work done by the Lady Medical Officer Dr. (Mrs.) Chitty who took charge of the Female Malay Hospital in July, 1927.

#### NEGRI SEMBILAN.

Table "A" shows numbers treated in the different hospitals and clinics during the year. It is noticed that there has been an increase in the following centres, Seremban and Tampin, this increase in the latter place can be accounted for by the fact that a carefully selected dresser was sent to Kuala Lumpur for training. During the year 3,910 patients of both sexes received treatment showing an increase as compared with 2,467 in 1926.

The following table shows nationality and diseases treated during 1926 and 1927:

Nationality.		Total No.	Syphilis.	Gonorrhea.	Soft sore.		Total No	Syphilis.	Gonorrhea.	Soft sore.
Chinese	...	1,308	1,022	173	113	...	1,944	1,461	381	102
Tamils	...	696	380	193	123	...	1,108	595	428	85
Malays	...	221	111	100	10	...	509	307	189	13
Sikhs	...	109	48	38	23	...	135	94	34	7
Eurasians	...	23	13	8	2	...	34	16	16	2
Europeans	...	25	5	18	2	...	88	25	57	6
Others	...	85	53	22	10	...	92	51	36	5
Total		2,467	1,632	552	283	...	3,910	2,549	1,141	220

*Seremban Treatment Centre.*—During the year 1,374 patients of both sexes received treatment as compared with 782 during 1926, showing an increase of 592.

The following table shows nationality and diseases for 1926 and 1927:

1926.							1927.				
Nationality.			Total No.	Syphilis.	Gonorrhea.	Soft sore.	Total No.	Syphilis.	Gonorrhea.	Soft sore.	
Chinese	...	...	421	292	90	39	...	716	479	176	61
Tamils	...	...	183	95	69	19	...	348	154	159	35
Malays	...	...	60	31	26	3	...	115	45	65	5
Sikhs	...	...	35	20	10	5	...	52	27	18	7
Eurasians	...	...	17	9	6	2	...	27	13	13	1
Europeans	...	...	21	5	15	1	...	73	23	46	4
Others	...	...	45	28	14	3	...	43	18	22	3
Total			782	480	230	72	...	1,374	759	499	116

It will be seen that there has been a satisfactory increase in the number of Malays coming for treatment.

## PAHANG.

Table "A" shows the numbers treated in the different hospitals and clinics during the year, there has not been any marked increase in the attendance.

During the latter part of the year dressers from Bentong, Kuala Lipis and Temerloh have been sent to Kuala Lumpur for training in venereal diseases, in the future these places should show an increase.

The following table shows nationality and diseases treated during 1926 and 1927 :

		1926.					1927.				
Nationality.			Total No.	Syphilis.	Gonorrhea.	Soft sore.		Total No.	Syphilis.	Gonorrhea.	Soft sore.
Chinese	...	...	442	375	43	24	...	388	304	55	29
Tamils	...	...	115	56	40	19	...	192	105	54	33
Malays	...	...	48	23	22	3	...	92	33	57	2
Sikhs	...	...	19	13	6	—	...	38	29	6	3
Eurasians	...		8	6	2	—	...	1	—	1	—
Europeans	...		6	2	4	—	...	10	—	5	5
Others	...	...	11	10	1	—	...	30	23	5	2
Total			649	485	118	46	...	751	494	183	74

E. ARTHUR SMITH,  
*Specialist, Venereal Diseases, F.M.S.*



TABLE "A."

## SELANGOR.

	January.	February.	March.	April.	May.	June.	July.	August.	Septem-ber.	October.	Novem-ber.	December.	Total.
District Hospital,													
K. Lumpur—													
Syphilis ...	89	62	66	63	88	86	95	75	68	101	67	97	838
Gonorrhoea ...	24	23	46	20	31	33	45	29	38	42	47	37	413
Soft Sore ...	8	13	23	14	9	6	4	6	13	7	5	5	112
V. D. Clinic, K.													
Lumpur—													
Syphilis ...	174	177	150	174	186	203	233	224	227	223	209	187	2,368
Gonorrhoea ...	278	204	281	409	232	192	212	269	259	287	280	233	3,324
Soft Sore ...	4	18	41	20	6	18	7	15	13	12	18	26	198
Klang—													
Syphilis ...	45	52	85	57	76	63	93	92	81	110	83	95	922
Gonorrhoea ...	38	31	26	27	37	37	37	41	44	44	66	59	487
Soft Sore ...	8	5	7	17	5	8	6	4	7	10	13	15	105
Kajang—													
Syphilis ...	26	24	34	27	13	34	38	33	39	67	46	49	430
Gonorrhoea ...	6	4	6	4	12	9	9	6	8	6	8	8	86
Soft Sore ...	...	1	2	2	3	...	...	1	2	2	4	1	18
K. Selangor—													
Syphilis ...	...	...	1	...	1	...	...	...	...	...	...	...	2
Gonorrhoea ...	...	1	...	...	...	1	...	...	...	...	...	...	2
Soft Sore ...	...	...	...	...	...	...	...	...	...	...	...	...	...
K. Kubu—													
Syphilis ...	56	56	55	62	69	62	47	93	104	107	148	105	964
Gonorrhoea ...	4	8	15	10	5	7	6	15	16	15	13	20	134
Soft Sore ...	...	3	1	5	2	...	4	7	10	7	10	19	68
Serendah—													
Syphilis ...	4	2	6	14	26	13	26	23	26	32	70	61	303
Gonorrhoea ...	...	...	...	2	3	4	2	2	6	6	6	14	45
Soft Sore ...	...	...	...	...	...	2	2	2	1	1	1	...	9
P. Swettenham—													
Syphilis ...	1	2	3	2	1	3	4	...	1	6	8	4	35
Gonorrhoea ...	5	3	6	2	9	8	5	11	6	5	5	8	73
Soft Sore ...	3	2	...	4	1	2	2	2	2	3	2	1	24
Rawang—													
Syphilis ...	27	27	22	27	28	25	26	27	22	27	21	23	302
Gonorrhoea ...	4	6	13	7	10	9	13	13	12	5	8	7	107
Soft Sore ...	1	...	2	2	...	...	2	1	1	...	1	...	10
S. Bernam—													
Syphilis ...	2	5	3	...	...	1	...	...	...	...	...	...	11
Gonorrhoea ...	5	2	4	1	...	...	...	3	...	...	...	...	15
Soft Sore ...	2	1	...	...	...	...	...	...	...	...	...	...	3
Rasa—													
Syphilis ...	8	13	9	13	10	9	12	18	12	16	12	22	154
Gonorrhoea ...	5	2	5	5	7	5	4	5	4	5	3	3	53
Soft Sore ...	1	1	...	1	...	1	3	1	2	1	...	1	12
Sapantas Hos- pital—													
Syphilis ...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gonorrhoea ...	2	2	...	...	...	...	...	...	...	...	...	...	4
Soft Sore ...	...	...	...	...	...	...	...	...	...	...	...	...	...
S. Besi—													
Syphilis ...	6	11	7	4	7	29	51	83	43	39	58	52	344
Gonorrhoea ...	...	...	1	5	6	2	9	6	3	4	4	4	40
Soft Sore ...	...	...	...	...	...	...	1	2	...	...	...	...	3
Sepang—													
Syphilis ...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gonorrhoea ...	...	1	...	1	1	1	...	2	...	...	...	...	6
Soft Sore ...	...	2	...	...	...	1	1	...	...	...	...	...	4
T. Datoh—													
Syphilis ...	36	29	20	41	97	42	48	40	10	34	38	34	469
Gonorrhoea ...	5	9	7	6	6	...	3	2	2	3	6	6	55
Soft Sore ...	2	5	8	4	5	2	2	2	...	...	...	1	31
Federal Home—													
Syphilis ...	11	...	1	2	3	4	5	6	...	...	...	...	32
Gonorrhoea ...	19	...	3	3	5	5	4	4	...	...	...	...	43
Soft Sore ...	...	...	...	...	...	...	1	2	1	...	...	...	4
Monthly Total ..	883	901	1,007	1,009	1,001	905	1,012	1,207	1,100	1,227	1,322	1,108	12,682

TABLE "A"—(cont.).

PERAK.

[illegible]



TABLE "A"—(cont.).

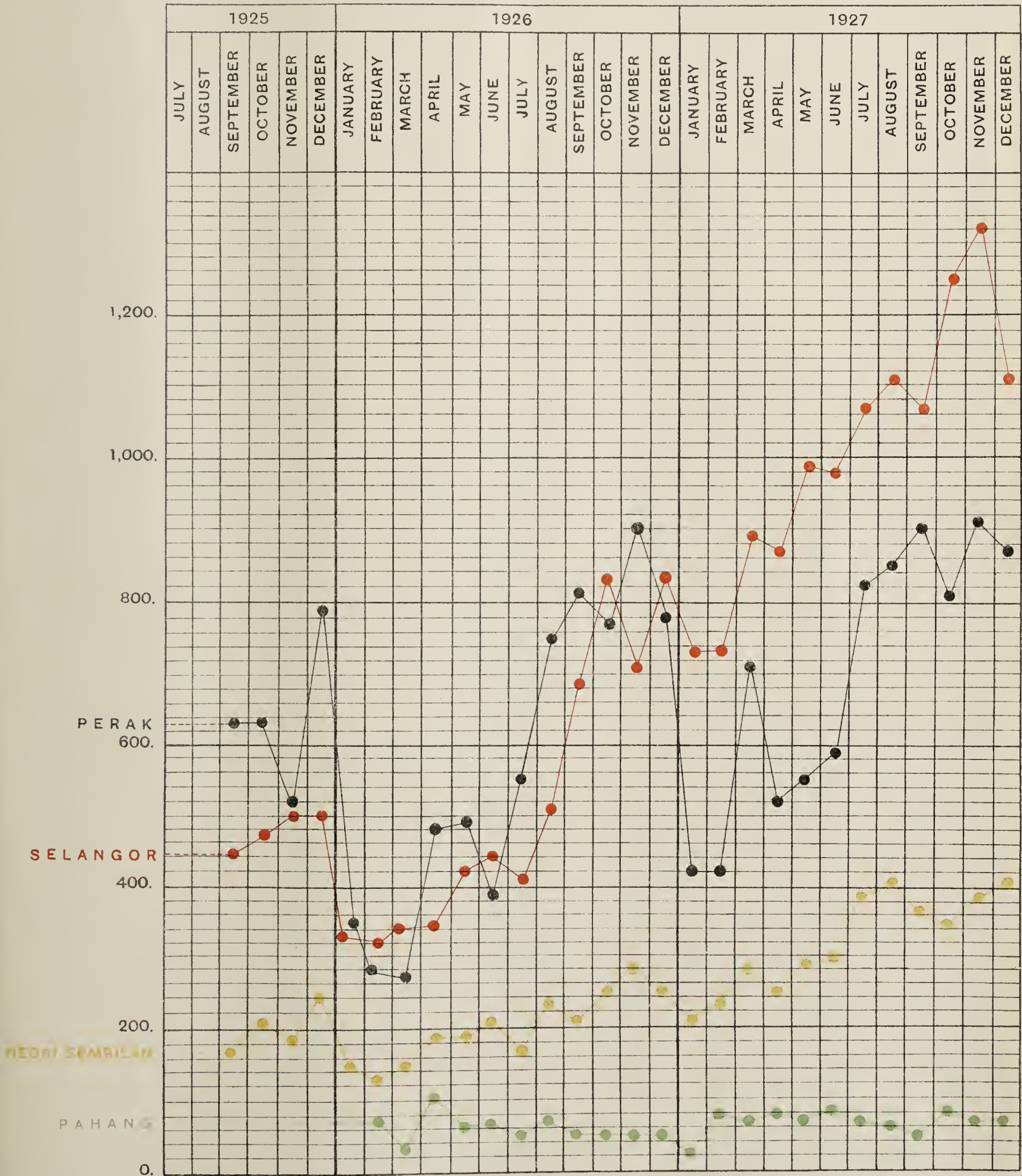
PERAK—(cont.).

	January.	February.	March.	April.	May.	June.	July.	August.	Septem-ber.	October.	Novem-ber.	December.	Total.
Tapah—													
Syphilis	8	8	34	39	46	51	61	53	63	66	70	70	569
Gonorrhoea	1	...	2	2	1	1	...	...	...	1	1	6	16
Soft Sore	1	..	...	...	2	...	1	...	...	1	...	...	5
Central Mental Hospital—													
Syphilis	12	22	27	10	14	20	13	22	17	26	30	28	241
Gonorrhoea	...	...	...	...	...	...	...	...	2	...	...	1	3
Soft Soro	...	...	...	...	...	...	...	...	...	...	...	...	...
Monthly Total	420	415	705	519	535	596	821	856	882	889	912	870	8,420
NEGRI SEMBILAN.													
Seremban—													
Syphilis	46	51	64	63	62	70	74	94	88	69	87	80	848
Gonorrhoea	34	16	43	36	25	39	46	70	84	70	95	86	644
Soft Sore	2	4	10	13	16	12	12	11	15	14	8	14	131
K. Pilah—													
Syphilis	47	68	87	59	73	71	84	85	30	35	35	40	714
Gonorrhoea	3	11	6	15	5	6	7	7	12	12	11	16	111
Soft Sore	...	...	...	...	2	3	2	2	...	...	...	...	9
Tampin—													
Syphilis	10	11	9	9	8	11	88	30	58	52	57	51	394
Gonorrhoea	10	3	5	9	6	7	7	14	18	24	21	28	152
Soft Sore	2	1	2	3	2	3	...	4	4	5	1	5	32
Jelebu—													
Syphilis	2	3	1	5	6	5	5	13	1	6	9	10	66
Gonorrhoea	6	3	1	3	4	4	1	4	...	4	1	6	37
Soft Sore	...	...	...	...	1	2	1	2	1	1	...	...	8
Gemas—													
Syphilis	17	23	29	4	15	5	12	15	28	25	18	11	202
Gonorrhoea	...	5	5	3	4	3	2	1	2	1	...	1	27
Soft Sore	6	...	2	1	2	2	3	3	3	...	...	1	23
P. Dickson—													
Syphilis	27	22	11	11	49	41	46	22	6	16	20	27	298
Gonorrhoea	3	8	4	2	4	4	1	10	6	12	13	5	72
Soft Sore	...	2	...	...	1	1	2	12	1	2	1	3	25
Mantin—													
Syphilis	...	1	6	5	5	3	...	5	8	3	6	5	47
Gonorrhoea	...	4	3	7	4	4	1	...	...	2	5	10	40
Soft Sore	1	...	...	1	...	...	...	...	...	...	1	3	6
Rembau—													
Syphilis	...	...	...	1	...	1	...	1	...	4	...	...	7
Gonorrhoea	...	...	1	2	2	2	1	2	1	...	2	3	16
Soft Sore	...	...	...	...	...	...	...	...	...	...	1	...	1
Monthly Total	216	236	289	252	296	299	395	407	366	357	392	405	3,910
PAHANG.													
K. Lipis—													
Syphilis	...	...	14	5	11	19	9	10	9	16	19	28	140
Gonorrhoea	...	2	6	6	1	1	8	7	5	7	8	10	61
Soft Sore	...	...	6	12	3	...	4	2	1	4	2	10	44
Raub—													
Syphilis	...	22	10	12	10	9	4	4	10	8	4	7	100
Gonorrhoea	...	1	1	...	...	...	1	...	...	...	2	2	7
Soft Sore	...	...	1	1	...	...	...	...	...	...	...	...	2
Bentong—													
Syphilis	...	20	21	31	13	15	19	9	4	28	17	4	181
Gonorrhoea	...	...	3	4	1	...	...	1	...	..	4	1	14
Soft Sore	...	...	...	...	...	...	...	...	...	...	...	...	...
Kuantan—													
Syphilis	...	5	1	...	2	10	3	4	4	7	7	1	44
Gonorrhoea	...	6	1	2	7	7	6	9	9	7	1	8	63
Soft Sore	...	...	3	...	...	1	6	2	...	1	...	1	14
Mentakab—													
Syphilis	...	14	1	1	9	3	2	7	5	1	2	...	45
Gonorrhoea	...	2	...	1	4	1	1	1	2	2	1	...	15
Soft Sore	...	...	...	...	1	1	...	...	1	...	1	...	4
Pekan—													
Syphilis	...	...	...	...	...	...	...	...	...	...	...	...	...
Gonorrhoea	...	...	...	...	...	...	...	...	1	3	6	4	14
Soft Sore	...	...	...	...	...	...	1	1	1	...	...	...	3
Temerloh, Rompin, Pontian, Pulau Tioman—													
Syphilis	...	...	...	...	...	...	...	...	...	...	...	...	...
Gonorrhoea	...	...	...	...	...	...	...	...	...	...	...	...	...
Soft Sore	...	...	...	...	...	...	...	...	...	...	...	...	...
Monthly Total	...	72	68	75	63	68	64	56	51	84	74	76	751





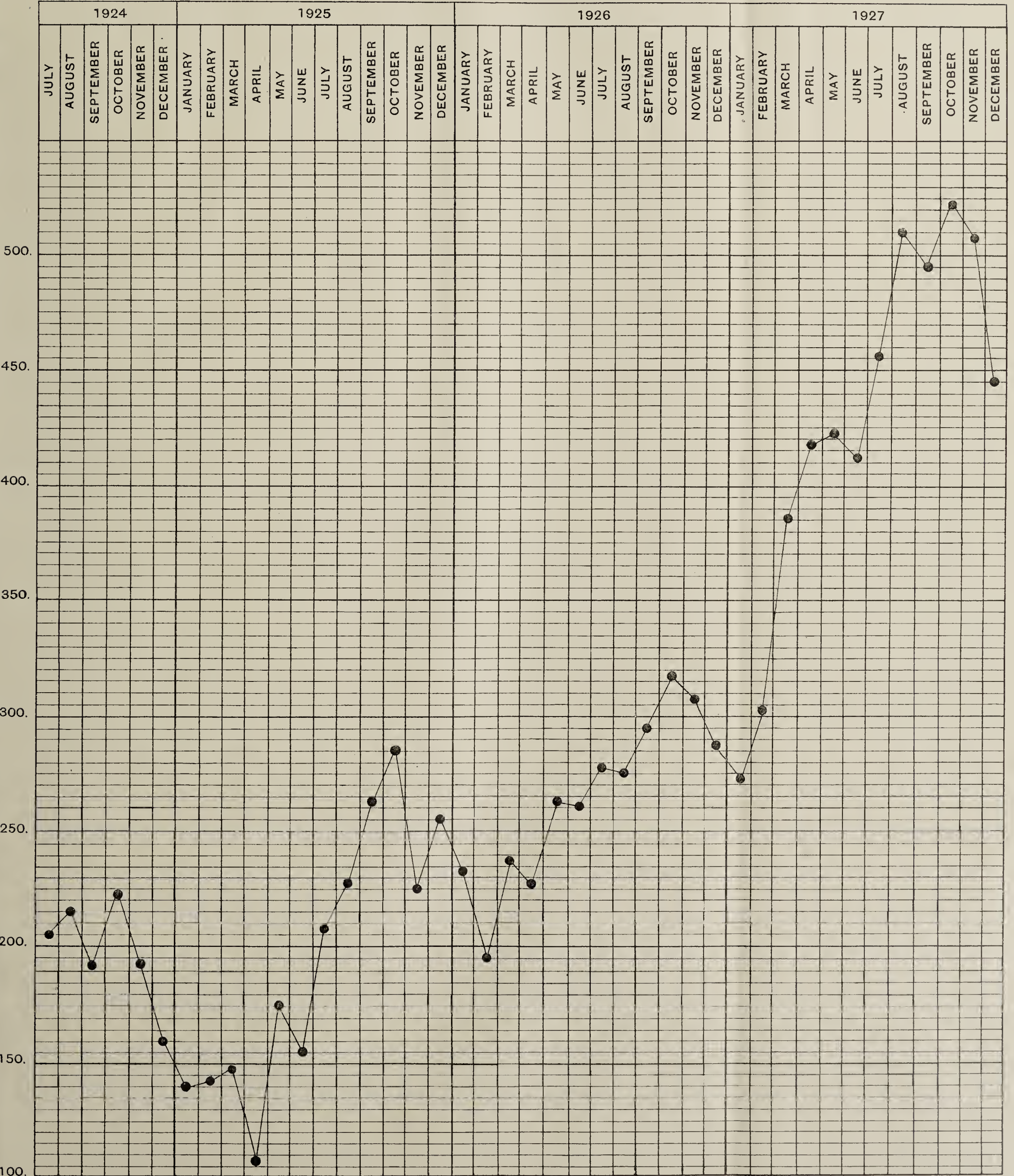
VENEREAL DISEASES  
 FEDERATED MALAY STATES  
 GRAPH SHOWING NUMBER OF ADMISSIONS







SULTAN STREET VENEREAL DISEASE TREATMENT CENTRE  
KUALA LUMPUR  
GRAPH SHOWING ADMISSIONS FROM JULY 1924 TO DECEMBER 1927







## APPENDIX K.

ANNUAL REPORT OF THE OPHTHALMIC OF THE IPOH EYE-CLINIC  
FOR THE YEAR 1927.

There has been a steady increase in the daily number of attendances. An increase of 500 over 1926; the total number of attendances was 11,546.

The number of in-patients reached 505.

The following figures indicate the growth of this department during the past five years :

Year.	New cases.								Total treated.
	Out-patients.				In-patients.				
1923	...	...	...	...	1,535	...	234	...	9,011
1924	...	...	...	...	1,780	...	391	...	6,373
1925	...	...	...	...	2,151	...	386	...	7,141
1926	...	...	...	...	3,470	...	491	...	10,367
1927	...	...	...	...	3,914	...	505	...	11,546

## OPHTHALMIC RETURNS FOR THE YEAR ENDING 31st DECEMBER, 1927.

OUT-DOOR.				Total.
		New cases.	Repetitions.	
1. Diseases.—				
Conjunctivitis ... ..	...	2,121	3,788	5,909
Gonorrhoeal ophthalmia ... ..	...	44	53	97
Trachoma ... ..	...	374	2,034	2,408
Lids ... ..	...	115	106	221
Keratitis ... ..	...	140	457	597
Iritis ... ..	...	72	159	231
Cataract ... ..	...	142	103	245
Ulcer cornea ... ..	...	180	440	620
Glaucoma ... ..	...	16	16	32
Retinitis ... ..	...	46	21	67
Pterygium ... ..	...	36	48	84
Lachrymal apparatus ... ..	...	22	102	124
Ocular muscles ... ..	...	7	3	10
2. Injuries.—				
Lid ... ..	...	14	11	25
Conjunctiva ... ..	...	19	8	27
Cornea ... ..	...	84	138	222
Iris ... ..	...	3	10	13
Lens ... ..	...	1	—	1
Eye ball ... ..	...	9	26	35
3. Refraction.—				
Myopia ... ..	...	57	27	84
Myopic astigmatism ... ..	...	24	3	27
Hyperopia ... ..	...	20	1	21
Hyperopic astigmatism ... ..	...	28	—	28
Presbyopia ... ..	...	93	2	95
Asthenopia ... ..	...	81	4	85
Diplopia ... ..	...	5	4	9
Night blindness ... ..	...	5	—	5
Amblyopia ... ..	...	2	—	2
4. General.—				
Facial paralysis ... ..	...	17	1	18
Frontal Neuralgia ... ..	...	6	1	7
Herpes Frontalis ... ..	...	5	15	20
Xerophthalmia ... ..	...	2	—	2
Keratomalacia ... ..	...	5	—	5
Proptosis ... ..	...	3	3	6
Third nerve paralysis ... ..	...	11	4	15
Sixth and seventh nerve paralysis ... ..	...	6	3	9
Cerebral growth ... ..	...	1	—	1
Jaundice ... ..	...	1	—	1
Exophthalmic Goitre ... ..	...	1	6	7
Secondary anaemia ... ..	...	4	—	4

					New cases.		Repetitions.		Total.
5.	<i>Disorganised eyes.</i> —								
	One	...	...	...	76	...	35	...	111
	Both	...	...	...	16	...	—	...	16
	Total				3,914	...	7,632	...	11,546
	<i>Nationalities.</i> —								
	Chinese	...	...	...	2,841	...	6,575	...	9,416
	Indians	...	...	...	710	...	809	...	1,519
	Malays	...	...	...	173	...	186	...	359
	Europeans	...	...	...	155	...	—	...	155
	Eurasians	...	...	...	33	...	57	...	90
	Japanese	...	...	...	2	...	5	...	7
	Total				3,914	...	7,632	...	11,546
	<i>Sex.</i> —								
	Male	...	...	...	3,437	...	6,157	...	9,594
	Female	...	...	...	477	...	1,475	...	1,952
	Total				3,914	...	7,632	...	11,546

## IN-DOOR.—ADMISSIONS.

1.	<i>Diseases.</i> —									
	Conjunctivitis	...	...	...	...	...	...	...	...	99
	Gonorrhoeal ophthalmia	...	...	...	...	...	...	...	...	44
	Trachoma	...	...	...	...	...	...	...	...	43
	Lids	...	...	...	...	...	...	...	...	11
	Pterygium	...	...	...	...	...	...	...	...	4
	Keratitis	...	...	...	...	...	...	...	...	34
	Ulcer cornea	...	...	...	...	...	...	...	...	72
	Iritis	...	...	...	...	...	...	...	...	31
	Cataract	...	...	...	...	...	...	...	...	66
	Glaucoma	...	...	...	...	...	...	...	...	12
	Retinitis	...	...	...	...	...	...	...	...	15
	Lachrymal apparatus	...	...	...	...	...	...	...	...	5
	Ocular muscles	...	...	...	...	...	...	...	...	1
2.	<i>Injuries.</i> —									
	Lid	...	...	...	...	...	...	...	...	4
	Conjunctiva	...	...	...	...	...	...	...	...	1
	Cornea	...	...	...	...	...	...	...	...	17
	Iris	...	...	...	...	...	...	...	...	3
	Lens	...	...	...	...	...	...	...	...	2
	Eyeball	...	...	...	...	...	...	...	...	2
3.	<i>General.</i> —									
	Facial paralysis	...	...	...	...	...	...	...	...	1
	Proptosis	...	...	...	...	...	...	...	...	2
	Keratomalacia	...	...	...	...	...	...	...	...	6
	Herpes frontalis	...	...	...	...	...	...	...	...	1
	Third nerve paralysis	...	...	...	...	...	...	...	...	6
4.	<i>Disorganised eyes.</i> —									
	One	...	...	...	...	...	...	...	...	18
	Both	...	...	...	...	...	...	...	...	5
	Total									505
	<i>Nationality.</i> —									
	Chinese	...	...	...	...	...	...	...	...	300
	Indians	...	...	...	...	...	...	...	...	170
	Malays	...	...	...	...	...	...	...	...	32
	Eurasians	...	...	...	...	...	...	...	...	2
	Japanese	...	...	...	...	...	...	...	...	1
	Total									505
	<i>Sex.</i> —									
	Males	...	...	...	...	...	...	...	...	428
	Females	...	...	...	...	...	...	...	...	77
	Total									505



## OPERATIONS.

## MAJOR.

*Operations.—*

Extraction of cataract ... ..	69
Decision and washing out capsule ... ..	4
Iridectomy ... ..	32
Iridotomy ... ..	2
Trephining ... ..	7
Enucleation ... ..	5
Evisceration ... ..	2
Sequestrotomy ... ..	1
Total ...	122

## MINOR.

Needling ... ..	10
Paracentesis ... ..	9
Expression of lid ... ..	1
Dilatation of canaliculus ... ..	57
Removal of sebaceous cyst of lid ... ..	1
Removal of foreign body cornea ... ..	38
Prolapsed iris snipped off ... ..	3
Dissection of pterygium ... ..	6
Plastic operation of lid ... ..	3
Conjunctival cyst aspirated ... ..	1
Removal of lachrymal cyst ... ..	1
Incision abscess lid ... ..	3
Total ...	133

Total number of operations ... ..	255
Sub-conjunctival injections ... ..	4

*Result of Cataract Operations.—*

Good ... ..	59
<b>Fair</b> ... ..	<b>5</b>
Diseased Retina ... ..	2
Iritis ... ..	6
Panophthalmitis ... ..	1
Total ...	73

*Gonorrhoeal Ophthalmia.—*

Condition of eye on admission—	
Cornea clear, ... ..	21
Cornea, ulcerated ... ..	16
Eye, disorganised ... ..	7
Total ...	44

Of the 21 cornea clear, three developed ulcer cornea during treatment.

*Chief Diseases.*—Conjunctivitis was easily the most frequent disease met with. Two thousand one hundred and twenty-one cases were seen and treated. Some very acute cases of the Kock Weeks type was seen amongst rickshaw pullers.

*Gonorrhoeal Ophthalmia.*—An outbreak was discovered amongst a kongsì of rickshaw pullers. Most of the sufferers were infected from one man, who had remained in the building receiving native treatment for gonorrhoea. From this one case eight or nine men were infected probably through infected linen. Forty-four cases were admitted during the year. Of these 44, 16 had serious damage of the cornea and in seven the eye or eyes were already disorganised. Only 21 cases afforded an opportunity for successful treatment and even in these series three developed corneal ulceration.

Instances are unfortunately still met with of infants with both eyes completely disorganised as the result of gonorrhoeal infection.

*Trachoma.*—Three hundred and seventy-four cases were seen during the year. A fair number of cases were infected in China, and investigations which have not been as yet completed indicate that the larger the number of Chinese immigrants in the year the greater the number of cases of trachoma seen at this clinic.

Treatment has been difficult owing to the fact that most of the cases come from quite a distance and local daily application of drugs is necessary for any good result. A new treatment with chaulmoogra oil is under trial.

*Injuries.*—One hundred and thirty cases were seen. The nature of the accident varied from laceration of the cornea from active bullock's tail, to complete disorganisation as the result of a durian falling on the up-turned expectant face of a Chinaman.

*Operations.*—Two hundred and fifty-nine operations as detailed above were performed.

*Conclusion.*—The great harm done by local treatment and local drugs still continues. A collection of various drugs sold in the bazaar is being made. The grave danger is the ulceration of the cornea produced mechanically by the fine grit used in the drug or drugs sold. Most of these drugs are very cheap and can be obtained in most shops.

Mr. Dias and Mr. Kim Sang have been of the greatest assistance to me during the year.

IPOH,  
18th January, 1928.

P. H. HENNESSY,  
Medical Officer and Ophthalmic Surgeon, F.M.S.



## APPENDIX L.

ANNUAL REPORT OF THE OPHTHALMIC DEPARTMENT, GENERAL  
HOSPITAL, KUALA LUMPUR, FOR THE YEAR 1927.

Sir,—I have the honour to submit my report on the work done in the Ophthalmic Department, Kuala Lumpur, during the year ending 31st December, 1927.

The number of patients treated were 4,178, of these 941 were in-patients and 3,237 were out-patients. The figures given below for the last three years show a steady increase in numbers since this department was organised :

Years.	No. of patients.
1925 ... ..	1,971
1926 ... ..	2,962
1927 ... ..	4,178

The nationalities were distributed as follows :

Nationalities.	No. of patients.
Chinese ... ..	957
Tamils ... ..	1,326
Malays ... ..	1,169
North Indians ... ..	413
Eurasians ... ..	102
Europeans ... ..	128
Others ... ..	83
Total ...	4,178

The total number of attendances during the year were 31,036.

The above figures show an all-round increase of 50 per cent. in the number treated and in the number of attendances. This shows a large sphere of usefulness and relief afforded by this department amongst all sections of the community. Many patients who in former times sought treatment in India and Java now come to us in increasing numbers.

The diseases met with are classified on anatomical basis and shown in a list appended herewith; but those commonly met with are given below with brief comments :

1. Catarrhal ophthalmia and conjunctivitis.
2. Trachoma.
3. Ulcer of cornea and its sequellae.
4. Errors of refraction.
5. Cataract.
6. Disease of the fundus.

*Catarrhal Ophthalmia* was found to affect a large number of people of all races in certain seasons of the year. This was particularly noticed during the months of April to May and August to September. In all cases a mixed infection of Kockweek's and Morax-Axemfeld Bacillus was found. The severity was less marked than in previous years.

*Trachoma* was chiefly, if not exclusively, met with amongst the Chinese and Northern Indians. A pamphlet on this subject on preventive lines was published by the Public Health Education Committee and distributed throughout the Federated Malay States and at the Agri-Horticultural Show held in Kuala Lumpur in 1927. The demand was so great as to induce the Chairman of the Public Health Education Committee to sanction a reprint in some thousands.

*Ulcer of Cornea* was often seen to follow neglect of trivial injuries followed later by disastrous results. Patients were seen so late that vision had already been lost or impaired. In several cases the infection had spread to the entire eyeball necessitating its removal.



In this connection attention must be drawn to several sad cases of blindness met with amongst very young children that come to us from estates following ulcer of cornea and kerato-malacia. The latter is seen in increasing numbers in ill-nourished children and adults following prolonged illness such as fevers, dysentery, diarrhoea, broncho-pneumonia, etc. The ulcer sets in insidiously on a devitalised cornea which gets destroyed in the course of a few days causing prolapse of iris and other complications resulting in blindness. Unfortunately in these cases both eyes become simultaneously involved. Should those that are to do with these children pay more attention to their nourishment and be on the alert to recognise the onset of the condition early and to assist the patient to obtain skilled treatment promptly much may be done to do away with the misery and hopelessness that often follow neglect. In all cases of prolonged illness it is as important to watch for ulcer of cornea as for a bed-sore.

*Errors of Refraction.*—Prescription for glasses by retinoscopy is being availed by a number of intelligent people, but the great majority visit the opticians first and come to us for correction afterwards, a costly method of self-help. However this section of work was patronised by large numbers of all sections of the community with great benefit.

One thousand five hundred and seventy-two persons were examined for purposes of enlistment in the public services.

*Cataract.*—The number of persons seeking relief from this disability shows an increase of almost 50 per cent. Except in a very few cases of impoverished health the results were very gratifying indeed. Many of our patients are very old, having had the cataract for a number of years, a circumstance which adds to the difficulties of successful operation and restoration of sight.

A few of the very poor patients were fitted with glasses after operation through the generosity of the Government and enabled to earn their livelihood.

*Disease of the Fundus.*—In the great majority of cases, diseases of the fundus were observed to follow venereal diseases and myopia which appears to be prevalent amongst the Chinese in particular. Very often the conditions observed in the eyes helped towards recognition of venereal disease which had not shown any other active signs.

In this connection, mention must be made of an interesting case of "blindness". The patient was a very young Chinese woman who was led to the clinic blind in both eyes except for slight perception of light. On examination the cornea of both eyes was covered by dense fibrous tissue resembling dense leukoma. The condition was diagnosed as interstitial keratitis and treated on anti-luetic lines. The opacity cleared in a few weeks and the patient was able to go about and earn her livelihood with but slight impairment of vision. This is an instance of several other cases where the ophthalmic signs if properly recognised may serve towards diagnosis of general diseases which are really responsible for the ophthalmic conditions.

*Operations.*—The total number of operations were 403, of this 164 were major and 239 minor. A number of new instruments that were supplied during the year and the consequently improved facilities and technique have helped towards better results. The gratifying results of operation for cataract were such as to induce patients who have lost their eye sight from other causes asking to be operated upon. Some very interesting cases of tumours of the eyes were seen and operated on successfully. Notes and photographs of one of them are attached as it shows to what length people in this country neglect to obtain timely treatment.

*General Remarks.*—From the preceding it will be evident that this department has proved a useful adjunct to both curative and preventive medicine and that the public are realising its benefits to increasingly greater extent. With better and greater accommodation to house and treat patients, still greater benefits are likely to accrue. But some means must be devised to bring home to the public and their medical attendants throughout the country the advantages of sending cases early enough to enable the patients to have adequate treatment. The evil results of quack practice in this branch of medicine are more far reaching than in others and measures adopted to get rid of these centres of mischief would go to reduce life-long suffering and misery. At least two such cases came under our observation recently.

One was a severe case of syphilitic irido-cyclitis. The patient, a Tamil youth, sought treatment at this hospital and was asked to be an in-patient. This he did and within a couple of days got himself discharged. It appears he sought treatment at the hands of an Indian "Eye Doctor" in Petaling Street and came back to us after a fortnight with panophthalmitis of the eye in which he originally had irido-cyclitis and sympathetic ophthalmia in the other eye.



with loss of vision in both. He is now a decrepit and a burden on the State. The other was a case of cataract in both eyes in an estate cooly. This man is said to have been operated on by another Indian "Eye Doctor" in Klang. What was done was the usual "couching" for cataract. This patient came in with severe panophthalmitis of the right eye with occlusion of the pupil and severe glaucoma. After a few weeks' treatment the glaucomatous symptoms subsided and by means of a peripheral iridectomy the patient was enabled to see objects near by. Later, the left eye was operated for cataract successfully and fitted with glasses. This man has now returned to his work after much suffering and some weeks' stay in hospital greatly handicapped in his struggle to earn a livelihood.

I enclose herewith a paper entitled "Common Diseases of the Eyes—their Neglect and Treatment", read by me before the Malaya Branch of the British Medical Association, as it shows in greater details some of the many disasters that follow ignorance and neglect.

In conclusion my thanks are due to the Principal Medical Officer, Federated Malay States, and the Senior Medical Officer, Selangor, for their continued interest in this branch of our work and for all the facilities afforded to me from time to time to ensure greater efficiency.

I have the honour to be,

Sir,

Your obedient servant,

A. VISWALINGAM,

Deputy Medical Officer in Charge,  
Ophthalmic Department.

#### DISEASES OF THE EYE ON ANATOMICAL BASIS.

##### *Lids.*—

Sebaceous cyst	...	...	...	...	...	...	...	16
Tarsal abscess	...	...	...	...	...	...	...	10
Trichiasis	...	...	...	...	...	...	...	26
Entropion	...	...	...	...	...	...	...	19
Blepharitis	...	...	...	...	...	...	...	27
Stye abscess	...	...	...	...	...	...	...	30
Meibomian abscess	...	...	...	...	...	...	...	45

##### *Conjunctiva.*—

Conjunctivitis	...	...	...	...	...	...	...	383
Chronic conjunctivitis	...	...	...	...	...	...	...	14
Phlyctenular conjunctivitis	...	...	...	...	...	...	...	65
Subacute conjunctivitis	...	...	...	...	...	...	...	33
Follicular conjunctivitis	...	...	...	...	...	...	...	11
Catarrhal conjunctivitis	...	...	...	...	...	...	...	73
Ophthalmia neonatorum	...	...	...	...	...	...	...	58
Trachoma	...	...	...	...	...	...	...	217
Foreign body	...	...	...	...	...	...	...	45
Pinguecula	...	...	...	...	...	...	...	14
Symblepharon	...	...	...	...	...	...	...	3
Sub-conjunctival ecchymosis	...	...	...	...	...	...	...	27

##### *Cornea.*—

Abrasions	...	...	...	...	...	...	...	24
Staphyloma	...	...	...	...	...	...	...	23
Macula	...	...	...	...	...	...	...	57
Leucoma and leucoma adherens	...	...	...	...	...	...	...	52
Foreign body	...	...	...	...	...	...	...	60
Ulcer	...	...	...	...	...	...	...	151
Keratitis	...	...	...	...	...	...	...	28
Keratomalacia	...	...	...	...	...	...	...	17
Opacities	...	...	...	...	...	...	...	5
Burns	...	...	...	...	...	...	...	12

##### *Sclera.*—

Episcleritis	...	...	...	...	...	...	...	—
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*Iris*.—

Iritis and irido-cyclitis	...	...	...	...	...	...	137
Dislocation	...	...	...	...	...	...	4
Aphakia	...	...	...	...	...	...	9

*Lachrymal System.*—

Dacryocystitis	...	...	...	...	...	...	...	4
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*Eye Ball.*—

Phthisis bulbae	...	...	...	...	...	...	...	17
Rupture of eyeball	...	...	...	...	...	...	...	13
Panophthalmitis	...	...	...	...	...	...	...	14
Contusion	...	...	...	...	...	...	...	5
Glaucoma	...	...	...	...	...	...	...	36
Lacerated wound	...	...	...	...	...	...	...	12
Tumours of the eye, epithelioma, etc.	...	...	...	...	...	...	...	3

## RETINOSCOPY AND REFRACTION.

Emmetropia	...	...	...	...	...	...	...	1,636
Asthenopia	...	...	...	...	...	...	...	13
Astigmatism	...	...	...	...	...	...	...	23
Myopia	...	...	...	...	...	...	...	278
Hyperopia	...	...	...	...	...	...	...	24
Presbyopia	...	...	...	...	...	...	...	49
Aphakia	...	...	...	...	...	...	...	1
Mixed astigmatism	...	...	...	...	...	...	...	1
Hyperopic astigmatism	...	...	...	...	...	...	...	14
Myopic astigmatism	...	...	...	...	...	...	...	41
Neuro-retinitis	...	...	...	...	...	...	...	13
Neuro-retino choroiditis	...	...	...	...	...	...	...	2
Choroidal and optic atrophy	...	...	...	...	...	...	...	5
Retino-choroiditis	...	...	...	...	...	...	...	11
Optic atrophy	...	...	...	...	...	...	...	16
Incipient cataract	...	...	...	...	...	...	...	2
Opacity of lens	...	...	...	...	...	...	...	10
Neuritis	...	...	...	...	...	...	...	13
Vitreous haemorrhage	...	...	...	...	...	...	...	1

## OPHTHALMIC OPERATIONS.

MAJOR.

Radical operations for entropion (partial tarsectomy) ...	...	10
Transplantation and excision of pterygium ...	...	26
Iridectomy (optical) ...	...	17
Iridectomy and trephining for glaucoma ...	...	2
Paracentesis of anterior chamber ...	...	10
Removal and dissection of cataract ...	...	65
Removal of tumours of the eye, epithelioma, etc. ...	...	3
Enucleation of eyeball ...	...	6
Evisceration of eyeball ...	...	10
Operation for symblepharon ...	...	1
Ablation of staphyloma of cornea and iris ...	...	12
Dacryocystectomy ...	...	2
	<b>Total ...</b>	<b>164</b>

MINOR.

Removal of foreign body from conjunctiva	...	...	...	45
Removal of foreign body from cornea	...	...	...	74
Sitching wound of the eyeball	...	...	...	6
Peritomy for pannus	...	...	...	4
Sub-conjunctival injections	...	...	...	15
Stye abscess	...	...	...	33
Chalazion	...	...	...	5
Meibomian abscess	...	...	...	39
Sebaceous cysts	...	...	...	8
Tarsal abscess	...	...	...	10
Total	...	...	...	239



Ah Kow, a Chinese boy aged 11 years, was admitted to hospital on 28th November, 1927, for "swelling" of the left eye which is said to have increased in size gradually during the last 10 years having appeared soon after birth.

The father says the eye was injured by the finger nails of the midwife who attended the mother in her accouchement and that a reddish looking body about the size of a pea appeared in the cornea and gradually grew to the present size.

*Clinical Notes.*—Patient is well developed. The skull is unusually prominent giving the appearance of hydrocephalus which is not the case; but the skull is of the brachy-cephalic type common to the Mongolian-race.

Patient has a soft lobulated tumour of the eyeball on the left side occupying the whole of the orbit which is hollowed out to almost thrice its size, and assuming the size of a fair-sized pear. The cornea is not visible and its region is covered by dense fibrous tissue. There is no pulsation or fluctuation felt and no glands are involved.

Eccenteration of left orbit was done in excising the tumour. Pathological report says "the tumour is of an inflammatory nature of a granulomatus type".

The wound healed up and patient was discharged on 6th January, 1928, fitted with an artificial eye.

## APPENDIX M.

ANNUAL REPORT OF THE RADIOLOGIST, FEDERATED MALAY STATES,  
FOR THE YEAR 1927.

The X-ray and Electro-Therapeutic facilities now available consist of:

## A.—X-RAY.

Five complete X-ray equipments, installed respectively at:

The X-ray building on the new Hospital site, Circular Road, Kuala Lumpur.

The District Hospital, Ipoh.

The Seremban Hospital.

The General Hospital, Kuala Lumpur.

The European Hospital, Kuala Lumpur.

The last-named set is mounted on a trolley and can be moved to other hospitals.

All these sets have worked well through the year, but the extreme dampness of the climate has been the cause of several minor breakdowns, which have mostly been repaired locally. The X-ray room at Ipoh, however, is so extremely damp that serious damage has been caused. For this reason it will be necessary to carry a large stock of spare parts of anything likely to be affected by the damp.

X-ray photographic films are now supplied in monthly consignments from Singapore. This has proved very much more satisfactory than ordering the year's supply from the Crown Agents.

The large and increasing number of dental cases examined calls for special notice, and there is no doubt that the discovery by X-ray of otherwise hidden and often unsuspected foci of infection at the tooth root is very greatly facilitating the diagnosis, treatment and cure of many of the cases of neuritis, myositis, "rheumatism" and general ill-health that were previously often attributed to other causes, or to "the climate".

A factor that tends very largely to reduce the usefulness and full efficiency of the X-ray Branch in Kuala Lumpur is the isolated position of the new X-ray building. Were the new hospital in Circular Road completed, a patient would have only a few yards to go from the ward to the X-ray room. As it is, four miles to the European Hospital and three to the General necessitates a long ambulance ride over bad roads, and entirely precludes the presence and very necessary collaboration of the Medical Officer or surgeon in charge of the case, thereby depriving the patient of several of the later methods of X-ray examination. In Ipoh and Seremban, and at the District Hospital here, where such collaboration can be got, much useful work has been done.

A "Serial Radiographic" apparatus has been delivered and will be installed immediately at Kuala Lumpur. With this equipment, a rapid series of instantaneous X-ray photographs of moving parts, such as the stomach with an opaque meal, can be taken while the visual, or screen examination is being made, thereby capturing on the photographic film important phases of the movement of parts that were previously only seen by the operator.

Electrical refrigeration for cooling the tanks for developing, fixing and washing the photographic films is being installed at Ipoh and Kuala Lumpur.

During the year approximately 2,300 X-ray cases have been seen, 1,136 at the new building, 598 at Ipoh, about 350 at Seremban, and others with the portable apparatus and at the General Hospital, Kuala Lumpur, from which figures are not available.

## B.—ELECTRO-THERAPEUTIC.

Four Diathermy Apparatus, one large, two portable and one Vario-Frequency.

A complete outfit of Surgical Electrodes and equipment for Surgical Diathermy.

A complete outfit for Genito-Urinary Diathermy.



Four "Pantostats" or multiple current generators, giving Galvanic, Faradic and Sinusoidal treatment currents and current for surgical lamps and cautery.

Two Schnee "Four Cell" bath sets.

Two small Faradism sets.

One modern "Multiple Wave" apparatus.

One large, self-contained Ultra Violet Quartz-Lamp apparatus.

Of the above equipment, the Diathermy sets, particularly the portable, which can be easily carried to the patient's house, have proved very useful, and have had a large amount of work. The older methods of treatment, as given by the "Pantostat" have been almost entirely superseded by Diathermy. The former will, however, be found most useful in outstation hospitals when the electric light is installed.

Although the Ultra Violet apparatus has only been in operation a short time, the results have been invariably good. Pyorrhoea Alveolaris, Alopecia, and Hay-fever cases have been cured.

During the year approximately 850 treatments have been given: 719 in Kuala Lumpur, the remainder mostly at Ipoh.

C. F. CONSTANT,  
*Radiologist, F.M.S.*

## APPENDIX N.

ANNUAL REPORT OF THE MEDICAL OFFICER IN CHARGE,  
LEPER ASYLUM, KUALA LUMPUR.

Sir,—I have the honour to submit the following report for 1927 concerning the Leper Asylum, Kuala Lumpur.

## NUMBER OF LEPERS TREATED.

The total number of lepers treated was 818 with 64 deaths as compared with 704 with 42 deaths during 1926.

## ADMISSIONS AND NATIONALITIES.

Two hundred and twenty-six cases were admitted. These consisted of 166 Chinese, 52 Tamils, 5 Malays, 1 Eurasian and 2 others. The Malays were later transferred to Pulau Pangkor Laut.

Of the 226 cases admitted, 122 had been diagnosed in some part of the Federated Malay States as suffering from leprosy and these were sent to the Asylum by the hospital making the diagnosis.

## VOLUNTARY ADMISSIONS.

The remainder of these cases numbering 104 were self-diagnosed and these voluntarily sought admission. In 1926, 74 cases similarly sought admission. During the past two years this has been granted when the diagnosis of leprosy has been confirmed by the Medical Officer on clinical and bacteriological grounds as the later lesions of syphilis and leprosy are occasionally somewhat similar and have been confused, especially by the Chinese.

This large proportion of admissions (46 per cent.) who have of their own accord come to the Asylum during the year is regarded as significant of an increased knowledge among the Asiatic population concerning leprosy and of the advantages of persuading or compelling lepers resident in their midst to go to an Asylum. It would also appear to be indicative of the appreciation by lepers, living outside, of the fact that, despite segregation, their disease will be treated and that they will be well looked after within the Asylum.

In addition, a large proportion of the lepers at present seeking admission, or sent by hospitals, are in the early stages of the disease. Previously, the Asylum was sought as a last resort by far advanced lepers mostly, these often being horribly mutilated and mostly very infectious. In these cases the relatives had grown tired of concealing them and looking after them. As regards cases sent by various authorities, it would appear that every effort is being made by Selangor hospitals to diagnose and segregate lepers coming under their notice for transmission to the Asylum at Kuala Lumpur.

## TRANSFERRED CASES.

Three cases with homicidal mania were transferred to the Central Mental Hospital, Tanjong Rambutan.

One man, a Sikh Police Corporal, exhibiting very early symptoms of leprous infection was repatriated to India under the New Indian Enactment relating to the Repatriation of Lepers, after negotiations with the Indian Government.

## NEGATIVE CASES.

Thirty-one cases who appeared to have lost all signs of their original leprosy and who had been under treatment for some years were examined bacteriologically from time to time during the year.

Of these 31 clinically negative cases, 9 were found to be bacteriologically positive, the remaining 22 cases remaining negative on repeated bacteriological examination.

## DISCHARGES.

In view of the above findings, the admitted imperfections of a thorough bacteriological examination, the fact that a case having been bacteriologically negative for 12 months, redeveloped leprosy at the end of 1926, and the wide distribution of the lepra bacillus found in the tissues and spleens of lepers autopsied by the Medical Officer in 1926, it was decided not to refer these cases to the Discharge Board constituted by the Principal Medical Officer. Further it was considered that these bacteriologically negative cases should be kept under observation and treatment for a longer period. Thus no cases were discharged during 1927.



## TREATMENT OF CASES.

Treatment by the administration of Tai Foong Chee by mouth as originally evolved by Dr. E. A. O. Travers has been carried on by the present Medical Officer in Charge for over two years. During 1927, five hundred and thirty patients have been taking this form of treatment regularly.

Many other methods of treatment have been in use, such as E.C.C.O. injections, vaccines locally prepared from leprous nodules, etherised chaulmoogra oil intravenously, and chaulmoogra oil by injection both subcutaneously and intramuscularly and in capsules given orally.

From observations on over 500 cases during the period mentioned, Tai Foong Chee is regarded as the most convenient and practicable form of treatment at present available for large numbers of lepers.

Many patients improve under this method and a fairly large proportion appear to have their leprosy arrested thereby.

In some few cases patients are unable to take Tai Foong Chee; for these other lines of treatment are adopted.

## INJECTIONS OF E.C.C.O.

In addition to Tai Foong Chee, E.C.C.O. injections were given to 211 patients, who received, in all, 3,390 injections.

Nationalities of patients were as follows:

Chinese	...	...	...	...	...	...	...	...	138
Tamils	...	...	...	...	...	...	...	...	61
Others	...	...	...	...	...	...	...	...	12
Total									211

Results are given as follows:

Forty injections and over. Number of patients 13.

Of these, nine were much improved, three were improved, one remained stationary.

Thirty injections and over. Number of patients 18.

Of these, eight were much improved, six were improved, eight were stationary, one became worse.

Twenty injections and over. Number of patients 34.

Of these, nine were much improved, 17 improved, one stationary, seven worse.

Ten injections and over. Number of patients 67.

Of these, 15 much improved, 32 improved, 14 stationary, 6 worse.

Below ten injections. Number of patients 80.

Of these, 19 were somewhat improved, 51 stationary, 10 worse.

## VARIOUS DRUGS USED IN TREATMENT.

Colloidal antimony by injection or colloidal manganese by oral administration are both frequently used. These appear to assist in healing of ulcers and unhealed surfaces due to the breaking down of leprous nodules or produced by trophic disturbances. In addition, painting of the surface with Mercurochrome 220 or 1 per cent. Methyl Violet, in reducing secondary infection, is of great help in promoting healing of this type of lesion.

A dispensary has been built by the leper and is kept fully stocked with medicines etc., for the treatment of the many intercurrent diseases affecting the inmates from time to time.

## THE LEPROUS "REACTION" AND ITS TREATMENT.

The leprous "reaction" or leprotic fever has varied and frequently severe manifestations. Its effective treatment is regarded as being of the greatest importance.

The reaction, essentially a curative phenomenon denoting an attempt to produce cellular defences and antibodies to the invading bacillus, may subside naturally and be followed by improvement but on the other hand the reaction may become excessive and end in much destruction of tissue with secondary infection.

Reactions may be readily induced by the administration of potassium iodide or by intensive treatment with one of the chaulmoogra derivatives.



Originally in 1925 it being thought that the reaction was of an allergic nature, injections of adrenalin were given with success, the reaction becoming arrested and settling down. Later these adrenalin injections were supplemented by the oral administration of hexamine as stated in my annual report for the year mentioned above.

Recently, in various parts of the world but principally in America, Ephedrine, an alkaloid derived from the stems of a Chinese plant Ma Huang (*Ephedra Vulgaris*) has been used as a substitute for adrenalin in the treatment of cases of asthma and hay fever. Over this latter drug Ephedrine has the double advantage of being more stable in solution and acting as effectively when given by mouth as by hypodermic injection. It was decided therefore to substitute Ephedrine by mouth for these adrenalin injections, in the treatment of leprous reactions.

For a while Ma Huang only was available in Kuala Lumpur, being bought from local Chinese medicine shops and infusions from the stems were given to lepers suffering from severe reactions. The results were so encouraging that a small supply of Ephedrine in the form of the hydrochloride was obtained. In all five cases to whom this drug was given the reaction was arrested and the raised, reddened nodules and plaques on the skin rapidly subsided. In one other case with swollen and inflamed ulnar nerves, relief of pain and throbbing was complete within fifteen minutes of taking the drug, the relief lasting for some days. Further investigations in this matter are being carried out.

#### EXPERIMENTAL WORK.

Whether the leprous reaction is due to the further dissemination of bacilli throughout the body with resulting fresh lesions or whether it is due to an acquired hypersensitiveness of the tissues to bacilli already present but not apparent to the unaided eye is a difficult point to determine.

It would appear that the latter is the more correct view from the following observations:

- (i) Nodules or raised plaques formed during a reaction are of a semi-oedematous nature and arise in such a rapid manner as to simulate acute reactive phenomena such as serum rash, urticaria, etc., except that the process is a somewhat slower one. The response in a reacting person to the causative bacillus in the skin or other tissues at first appears to be more of a serous and not of an entirely cellular nature.

It thus appears to be an acute phenomenon whereas the formation of leprous nodule in the ordinary course of events is a slow process consisting of cellular infiltration and the formation of many new blood vessels and lymph spaces, ending in a solid type of granulomatous tumour.

- (ii) Nodules or plaques formed rapidly during a reaction contain very few lepra bacilli whereas the usual leprous nodule contains many.
- (iii) The raised oedematous nodules formed during a reaction as a rule subside rapidly on treatment or when the reactive phase has passed. Original leprous nodules remain the same size.
- (iv) Experimentally it has been found that an intra-dermal injection of lepra bacilli obtained from a freshly excised and ground leprous nodule produces a somewhat similar raised reddish patch in a leper who is in a reactive or sensitised phase but in a non-reactive or quiescent leper no similar skin reaction is obtained under the same experimental circumstances.

#### NOTES ON THE ABOVE.

This skin phenomenon has been observed in two cases having a leprous reaction, four quiescent or non-reactive lepers being used as controls. In each of the six cases investigated an intra-dermal injection of isotonic salt solution was used as a further control. The amounts injected in each case were .1 cc. emulsion containing lepra bacilli and .1 cc. isotonic salt solution.

In all six cases the small intra-dermal wheal caused by the injection of the salt solution disappeared rapidly with no enlargement, redness or formation of pseudopodial processes of the wheal.



The injection of the emulsion containing the lepra bacilli in the four non-reacting lepers caused a raised wheal with no surrounding reactive manifestations. The appearance of the skin returned to normal in about seventy-two hours but some of the patients complained of feeling a little feverish.

This emulsion, however, when injected intra-dermally into the two lepers in the reactive state produced a wheal which in half an hour became definitely enlarged and surrounded by a zone of redness. In a few days this settled down forming a flattened red patch bearing a close resemblance to the raised patches already on the skin. This appearance has remained for over two months, i.e., up to the present time of writing. Photographs of the various stages of these intra-dermal wheals have been taken and it is proposed to repeat the experiment in a further series of cases.

#### MODE OF INFECTION IN LEPROSY.

In collaboration with the Institute for Medical Research experiments have been undertaken in connection with the determination of the mode of infection in leprosy.

Monkeys (*macacus cynomologus*) are being used as experimental animals and material for the attempted infections has been obtained from nasal washings of cases having ulcerating lesions on the nasal septum found on preliminary examination to yield large numbers of bacilli. Additional infective material has been obtained from leprosy nodules recently excised and ground with sterile sand, the final supernatant emulsion containing the bacilli being then decanted.

Three attempted routes of infection have been employed.

- (i) *Inoculation*.—Bacilli injected subcutaneously into the palm of the hand.
- (ii) *Inhalation*.—Emulsion of bacilli sprayed into the nasal cavity.
- (iii) *Ingestion*.—A quantity of the emulsion has been passed into the stomach by means of a stomach tube.

The experiment has been repeated on the same animals on two occasions but it has been in progress for some weeks only and as yet there are no results to be seen.

#### MINOR SURGERY.

Fifty minor operations such as the removal of dead bone, amputation of hopelessly diseased appendages, opening of abscesses, repair of wounds, etc., have been performed during the year.

#### EPIDEMIC DISEASES.

In contrast to previous years there has been no epidemic disease such as influenza or measles affecting a proportion of the inmates. No cases of malaria acquired at the site of the Asylum have been observed.

#### BUILDINGS AND EXTENSION.

Wards No. 1 and No. 5 have been repaired by the Public Works Department.

There are a number of skilled artisans among the leper inmates of the Asylum. These men have built 12 new wards of a temporary type each to hold fourteen. In addition, they have effectively repaired wards 6, 7, 8, 10, 11, 12, 13 and 14.

#### PLANTING OF HYDNOCARPUS TREES.

Hydnocarpus seeds received from Siam were made to germinate after some difficulty. There are now 51 Hydnocarpus Anthelmintica and two Hydnocarpus Wightiana trees in a flourishing condition growing within the Asylum grounds.

#### EDUCATION OF LEPER CHILDREN.

Thirty leper children are receiving an excellent education at the hands of Mr. Yen Zye Yew, who is the schoolmaster to the Leper Asylum.

Subjects taught are reading, dictation, arithmetic, drawing, English, hygiene, singing, ethics and physical culture.

#### RECREATIONS AND AMUSEMENTS.

Cricket and badminton are played regularly and enjoyed by many of the inmates. The Chinese, Tamil and Telegu Theatrical Societies are very active and frequently give excellent performances.

Athletic sports have been held on two occasions during the year, large numbers of competitors entering for the different events in a long and varied programme. Many of the inmates go into training for these sports some weeks beforehand and the standard of their performances is surprisingly high.



All festival days of the various nationalities were celebrated during the year in the appropriate manner, especially by the Chinese who on these occasions provided a most spectacular parade round the Asylum grounds with lanterns, dragons, and costumes made by themselves.

On Christmas Day the children were given a Christmas tree and feast, numbers of toys being distributed among them; each children receiving two or more toys. This was followed by an entertainment provided by Mr. Chan Tong Yen, one of the inmates, who is a conjuror and illusionist of extraordinary ability. A number of well-known Christmas carols sung by the children in chorus to the original English tunes with Chinese words provided an interesting although somewhat pathetic conclusion to the ceremony.

#### STAFF.

The Medical Officer in Charge visits the Asylum generally twice daily.

The Visiting Assistant Surgeon, Mr. A. Ponniah, was replaced by Mr. A. Doraisamy during the year.

The remainder of the staff are lepers.

Mr. H. J. Bain, the Steward, has continued his invaluable work of previous years and by his constant supervision and tactful understanding has done much to promote contentment and harmonious relations among the large numbers of inmates of mixed classes and nationalities. His work, often performed under great difficulties, deserves the greatest praise.

Mr. W. N. Woodford, the Resident Dresser, joined the staff from Perak early in the year. He has been of great assistance and is in immediate charge of the hospital for helpless cases, also the dispensary where he has given some thousands of injections and has attended to the numerous requirements of the inmates in addition to supervising the large number of dressings required daily.

Mr. Wong Ah Cheong, the clerk, also joined the staff from Perak early in the year and is in charge of the various records of patients, accounts, copies of vouchers, etc., and has ably assisted Mr. Bain from time to time.

Mr. Wai Ah Chai, the head attendant, has continued his good work of previous years in supervising the ward attendants, coolies, gardeners, etc., and preventing the formation among the Chinese of secret societies which are invariably undesirable and productive of evil consequences.

#### GENERAL.

##### TREATMENT OF LEPROSY.

Work on the treatment of leprosy as reported in medical journals from various parts of the world has been carefully studied during the year. There has been no epoch making discovery as regards treatment but various improvements in the use of chaulmoogra derivatives have been advocated from time to time. The pendulum swings from one chaulmoogra derivative to the other always with chaulmoogra oil as the central point.

The certain cure for all cases is still withheld from us and as yet there appears to be no specific drug or compound which can be administered in the certainty that the leprous lesions will disappear and that every bacillus in the sufferer's body will be destroyed. A certain proportion of chaulmoogra tolerant cases improve under treatment by this method and a certain proportion depending to some extent on the stage at which treatment is commenced lose all clinical signs of their leprosy. On the other hand with some early cases, the leprous lesions become gradually worse, despite chaulmoogra treatment of various kinds plus various adjuvants to treatment reported as successful in the hands of some workers. That a leper becomes bacteriologically negative under treatment is unfortunately still regarded as the exception but not as the rule.

Although it is undesirable that one's judgment of the present position be overshadowed by unresponsive cases it is equally undesirable that cases which have become apparently negative and uninfected after prolonged treatment be given undue prominence in newspapers and lay journals. Stimulus should certainly be given by these successes to work on leprosy throughout the world but it is both unjust and unwise to permit publication of exaggerated reports on this important matter. The awakening from false hopes and false security for the unfortunate sufferer who does not respond to treatment and who gradually becomes worse is necessarily a most bitter one both for him and for his relatives.



## THE PROBLEM OF SEGREGATION.

It is agreed that in this country at least segregation in all cases is essential. Following segregation however, the patient must be made to feel that he is being welcomed to a community of sympathetic fellow-sufferers and that he is being protected from the degradation and shame imposed on him by the attitude generally adopted towards his disease.

For many people, once a leper enters an Asylum or Settlement, that is an end of the matter and it is felt that justice has been done in removing a dangerous source of infection from the midst of a more or less healthy community. In reality, responsibility in connection with the leper has just begun.

He is being sentenced in most cases to life imprisonment for his misfortune in contracting one of the many ills human flesh is heir to, except that in this case the disease is regarded with all the horror and loathing engendered by Biblical description and the attitude towards it handed down to us from mediaeval times.

Some authorities have advocated a modified form of segregation and have proposed that old nerve-anaesthetic and other so-called uninfected lepers be given their freedom. This departure however is quite unsuited to this country and regarded as dangerous until we know for certain the exact mode of transmission and acquisition of the disease.

In the meantime, segregation remains the only policy to be adopted but this must be justified by continued care and efforts directed towards improving the general lot of Leper Asylum or Settlement inmates. Treatment, cleanliness, good food, exercise, recreation and the awakening of personal responsibility; all have their place and all are of importance.

The transition from an unkempt, filthy, hunted looking leper whose sores are neglected and bound with dirty rags and who has for months been hidden in some dark corner of a kampong to a clean, skin-whole, self-respecting member of an organised community, is in most cases a matter of some weeks only.

For a number of years much attention has been directed to the local leper problem by the Federated Malay States Government through the Medical Department. The Leprosorium at Sungei Buloh promises to be one of the finest and most up-to-date Institutions of its kind in the world. There is little doubt that the main source of our leprosy has been, and still is, Southern China, and although diagnosis of early stages of the disease is a difficult matter, all immigrants on entering Malaya should be most carefully examined for signs of the disease.

At the present stage of our knowledge, it is too much to hope that leprosy will be eradicated from this country in a specified number of years.

It is thought, however, that, with special attention directed towards the examination of immigrants, increased knowledge regarding the earlier manifestations of the disease being disseminated among the local Asiatic population and with an efficient Institution for segregation and treatment such as the Leprosorium at Sungei Buloh, that the incidence of leprosy in the Federated Malay States will constantly diminish and that each decade will witness a great decrease in the number of those afflicted.

I have the honour to be,

Sir,

Your obedient servant,

RICHARD GREEN,

*Medical Officer in Charge, Leper Asylum,  
Kuala Lumpur.*



## APPENDIX O.

REPORT ON THE INFANT WELFARE WORK IN KUALA LUMPUR  
FOR THE YEAR 1927.

In the year 1927 the Infant Welfare Centre had no less than five successive Lady Medical Officers in charge of it. That the work done does not appear to have suffered on the whole must be put down to two factors, firstly the excellent organisation of the work and the good start given to it during its initial years, and secondly to the devotion of the staff who are exceptionally keen and interested in the work.

This report has been compiled largely from hearsay and from a study of the record sheets. Any personal opinions expressed refer strictly to the last two months of the year, during which time the present writer has been in charge of the Centre. The work will be considered in two sections, the work done actually at the Centre and the health visitors' work in the district. In addition to this work which goes on all the year round, an Infant Welfare exhibit again formed part of the Malayan Agri-Horticultural Exhibition held in Kuala Lumpur in August.

## THE STAFF.

One Lady Medical Officer;  
Two European Nursing Sisters;  
Six health visitors;  
One laboratory assistant;  
One dispenser;  
One clerk;  
One ayah;  
One toti (sweeper);  
One peon (messenger);  
Two drivers (motor car).

The most striking feature of this year's work at the Centre has been the increase in Malay attendance; 10,833 Malays attended this year as compared with 4,464 in 1926. The attendances amongst the other nationalities have fallen off a little, but owing to the Malay increase the total number of cases seen has increased. The Malays were mostly conveyed to and from the Centre by bus, but a few came of their own accord, and even from quite considerable distances. Amongst the other nationalities cases came of their own accord from great distances such as 20 to 30 miles or even 40 miles. Some of these are hospital cases and are sent on to hospital if it can be arranged, but it is sometimes impossible to do this if the bus is out on its rounds, and thus a good deal of work which cannot strictly be called preventive medicine has been done at the Centre. It must be confessed that a considerable amount of work done at the Centre should by rights be done at the hospitals, or at a women and children's out-patient clinic. This can easily be arranged when the proposed plan is carried out of an out-patient clinic in which the Infant Welfare Centre is a department of the whole. In the meanwhile patients will come readily to the Centre, though to go to hospital is too great an adventure. The knowledge that they will be seen quickly either by the Lady Medical Officer or the Sister may partly account for this willingness. The Infant Welfare Centre has, however, done very useful work in persuading cases to go for treatment in hospital or the V.D. Clinic.

As far as the actual Infant Welfare work is concerned there is no difficulty now in persuading the mothers to follow the advice given. The Chinese in particular are very quick at picking up new ideas and usually carry out any instructions very well. Mothers who have had advice during the rearing of previous infants bring up their babies to the Centre merely to have them admired and weighed, as they now know how to feed and bring up their children. One point these Chinese mothers have in common with the average mother seen at any Welfare Centre in England is the tendency to overdress their children. Babies are sometime brought with four little coats over a binder, the outer coat being made of some thick woollen material, and the mother expresses great doubt and unwillingness at the idea of removing at least two or perhaps three of these coats. The Malays and Tamils do not offend in this manner.



Ante-natal work is not yet recognised by the mothers as a really important branch of Infant Welfare work. However, there has been an increase of attendances to 599 for the year 1927 as compared with 398 for 1926. Many of these mothers came up on account of some complaint of pregnancy or for some incidental illness; but quite a number came merely for the routine examination, and most of these were willing to attend more or less regularly as advised.

#### THE HEALTH VISITORS' WORK IN THE DISTRICT.

The visits paid by the health visitors to the homes were not so numerous as in 1926, the number of cases visited in 1927 being 13,465 as compared with 15,285. On the other hand, however, there has been a great increase in the amount of cases brought by the health visitors to the Centre in 1927, 19,597 cases being brought in the bus as compared with 9,833 in 1926. The bus makes four journeys daily, starting out in the morning at 7.30 a.m. and after leaving one load of patients at the Centre setting out again on its round. By the time the second load arrives the first set of patients have been seen and are ready to be returned to their homes. One health visitor always accompanies the bus, firstly collecting the patients from their homes and then taking them back again. Thus, in cases where the father has to be consulted the health visitor can see him herself. On the day before the bus goes round the health visitor, due to accompany the bus next day, visits the various kampongs and advises the mothers as to which cases should be taken to the Centre and persuades the ignorant or unwilling to take the children up. The Sister in charge of the district usually accompanies the visitors on these journeys so that the home visiting is supervised and added authority given to the general instructions and advice.

Tables of attendances and visits are appended.

M. E. HOPKINS,  
*Lady Medical Officer, Infant Welfare Centre,  
Kuala Lumpur.*

#### RECORD OF ATTENDANCES, INFANT WELFARE CENTRE.

1927.			Infants.		Children.		Women.		Total.
January	...	...	891	...	1,329	...	399	...	2,619
February	...	...	768	...	1,164	...	555	...	2,487
March	...	...	953	...	1,610	...	556	...	3,119
April	...	...	800	...	987	...	354	...	2,141
May	...	...	975	...	1,376	...	434	...	2,785
June	...	...	677	...	1,248	...	366	...	2,291
July	...	...	706	...	1,346	...	454	...	2,506
August	...	...	800	...	1,726	...	581	...	3,107
September	...	...	743	...	1,542	...	564	...	2,849
October	...	...	717	...	1,530	...	552	...	2,799
November	...	...	966	...	1,872	...	746	...	3,584
December	...	...	1,065	...	1,831	...	796	...	3,692
Totals, 1927			10,061	...	17,561	...	6,357	...	33,979
,, 1926			20,792	...	4,643	...	4,396	...	29,831
,, 1925			16,005	...	4,259	...	2,870	...	23,134
,, 1924			9,106	...	3,193	...	4,039	...	16,238
,, 1923			5,777	...	2,872	...	3,559	...	12,208

N.B.—In the year 1927 “Infants” signified from birth to one year. Formerly “Infants” included children up to five years.

## RECORD OF ATTENDANCES BY NATIONALITIES, INFANT WELFARE CENTRE.

1927.	Chinese.	Tamils.	Malays.	Others.	Total.
January ...	1,452	337	750	80	2,619
February ...	1,279	315	845	48	2,487
March ...	1,747	387	922	63	3,119
April ...	1,275	238	580	48	2,141
May ...	1,607	296	802	80	2,785
June ...	1,318	306	611	156	2,291
July ...	1,296	266	864	80	2,506
August ...	1,732	276	1,011	88	3,107
September ...	1,488	298	1,002	61	2,849
October ...	1,358	258	1,112	71	2,799
November ...	1,907	352	1,220	105	3,584
December ...	2,105	382	1,114	91	3,692
Totals, 1927 ...	18,564	3,711	10,833	871	33,979
„ 1926 ...	19,564	4,618	4,464	1,185	29,831
„ 1925 ...	15,331	4,095	2,355	1,353	23,134
„ 1924 ...	11,300	3,369	582	987	16,238

## MATERNITY AND CHILD WELFARE WORK DONE DURING THE YEAR.

Nature of work.	Total.
Number of Clinics held ...	538
„ mothers seen by Doctor—	
Ante-natal ...	599
Post-natal ...	129
Others ...	2,598
Number of babies entered on register during the year ...	1,584
„ „ seen by Doctor ...	3,910
„ „ weighed ...	2,637
„ children normal ...	4,497
„ babies „ ...	4,120
Number of children and babies suffering from incorrect feeding ...	1,192
Number of babies and children suffering from worms ...	7,296
Number of cases (mothers, children and babies) suffering from malaria ...	1,866
Number of cases referred to hospital ...	172

## HEALTH VISITORS' VISITS TO HOMES.

1927.	Total.
January ...	1,581
February ...	1,429
March ...	1,584
April ...	1,122
May ...	1,244
June ...	800
July ...	1,183
August ...	932
September ...	951
October ...	838
November ...	991
December ...	810
Totals, 1927 ...	13,465
„ 1926 ...	15,285
„ 1925 ...	13,221
„ 1924 ...	10,532
Visits paid by Sisters ...	4,951
Number of patients conveyed by transport ...	19,597



## APPENDIX P.

REPORT ON MATERNITY AND CHILD WELFARE WORK IN IPOH  
FOR THE YEAR 1927.

PREMISES.

The work of the Centre is still being carried on in the Yau Tet Shin building, Club Road. The building itself is proving very satisfactory regarding both position and accommodation. It consists of two wings—one being used for the Dispensary and Dresser's quarters—the other having the health visitors' quarters on the first floor with waiting, consultation, examination and dressing rooms on the ground floor. These rooms are very well ventilated and lighted. The Welfare Sisters have been occupying since June 1st new Class V quarters built specially for them in Windsor Road.

STAFF.

One Lady Medical Officer.  
Two European Nursing Sisters.  
Two health visitors.  
One clerk.  
One female attendant.  
One dispenser.  
One dispenser.  
One dispensary attendant (male).  
One messenger.

The dispensing is done by the dresser-in-charge of the Town Dispensary. Sister Goulding returned from leave on June 3rd, and on November 8th I took over from Dr. Hewitson.

## WORK AT THE CENTRE.

The Centre itself continues to grow more popular. The patients are by now quite accustomed to the change of quarters and attendances are consequently increasing. During the first half of the year there has been a severe epidemic of whooping cough.

Attendances, 2nd-half-year 1926	...	...	...	...	...	7,246
„ 1st half-year 1927	...	...	...	...	...	8,375
„ 2nd half-year 1927	...	...	...	...	...	8,421

The work is more curative than preventive but nothing is done to discourage the attendance of any patient whether she is seeking ordinary out-patient treatment or advice on maternal or child welfare matters.

A woman may visit the Centre merely to have an abscess opened but is then advised regarding her children's welfare and persuaded to bring them along for further advice and treatment. I do not think the time has yet come when the Centre can be confined to maternal and child welfare only. The teaching at the Centre is mostly individual. Each mother as she presents herself or children for examination is instructed about infant feeding and general hygiene. There are demonstrations in the preparations of food for infant feeding every Friday at 9 a.m. The number of infant attendances at the weight Clinic is 503 more than in 1926.

1927	...	...	...	...	...	...	Babies weighed—1,116
1926	...	...	...	...	...	...	613

The microscopical examinations of blood, chemical examination of urine and simple tests are done at the Centre since November.

## ANTE-NATAL WORK.

The number of cases which have been kept under observation for several months before confinement and visited by the health visitors exceeds that of 1926.

1927	. . .	. . .	. . .	. . .	. . .	. . . <sup>d</sup>	. . .	. . .	. . .	818
1926	. . .	. . . e l	. . .	. . . f	. . .	. . . <sup>a</sup>	. . .	. . .	. . .	300

## HEALTH VISITING IN THE HOME.

During the year, this the most important part of welfare work has increased considerably. Each week a list of birth notifications is sent by the Police Department and births within a radius of about four miles are entered in the Welfare Birth Register. The Sisters are spending more time visiting the homes than in previous years and the results of their work are becoming most gratifying. A great deal of time is given to the instruction of the mothers in our methods in their homes as well as at the Centre. It is noted that the worst cases of neglect and incorrect feeding come from places outside the area visited by the Welfare staff.

Visits to homes by health visitors,	2nd half-year 1926	...	4,369
"	1st half-year 1927	...	7,350
"	2nd half-year 1927	...	7,060

## RECORD OF ATTENDANCES FOR THE YEAR 1927.

## INFANT WELFARE CENTRE.

Month.			Infants.		Children.		Women.		Total.
January	...	...	153	...	575	...	374	...	1,102
February	...	...	183	...	547	...	386	...	1,116
March	...	...	241	...	732	...	462	...	1,435
April	...	...	208	...	854	...	390	...	1,452
May	...	...	406	...	1,081	...	377	...	1,864
June	...	...	254	...	762	...	390	...	1,406
July	...	...	206	...	723	...	438	...	1,367
August	...	...	181	...	724	...	388	...	1,293
September	...	...	195	...	751	...	352	...	1,298
October	...	...	207	...	675	...	409	...	1,291
November	...	...	242	...	930	...	502	...	1,674
December	...	...	250	...	818	...	430	...	1,498
Total, 1927									16,796
Total, 1926									14,080

## RECORD OF ATTENDANCES BY NATIONALITIES.

Month.	Chinese.		Tamils.		Malays.		Others.		Total.
January	540	...	456	...	88	...	18	...	1,102
February	539	...	432	...	121	...	24	...	1,116
March	788	...	553	...	82	...	12	...	1,435
April	690	...	491	...	244	...	27	...	1,452
May	928	...	566	...	361	...	9	...	1,864
June	819	...	447	...	132	...	8	...	1,406
July	882	...	396	...	68	...	21	...	1,367
August	692	...	476	...	105	...	20	...	1,293
September	741	...	470	...	73	...	14	...	1,298
October	694	...	489	...	102	...	6	...	1,291
November	897	...	594	...	177	...	6	...	1,674
December	780	...	513	...	196	...	9	...	1,498
Total, 1927	8,990	...	5,883	...	1,749	...	174	...	16,796

## HEALTH VISITORS' VISITS TO HOMES.

January	...	...	...	...	...	...	...	1,330
February	...	...	...	...	...	...	...	1,112
March	...	...	...	...	...	...	...	1,387
April	...	...	...	...	...	...	...	1,129
May	...	...	...	...	...	...	...	1,647
June	...	...	...	...	...	...	...	1,056
July	...	...	...	...	...	...	...	749
August	...	...	...	...	...	...	...	1,429
September	...	...	...	...	...	...	...	1,397
October	...	...	...	...	...	...	...	1,290
November	...	...	...	...	...	...	...	1,372
December	...	...	...	...	...	...	...	846

Grand Total, 1927 ... 14,744

Grand Total, 1926 ... 5,897

Grand Total, 1925 ... 1,309



## MOTHERS AND BABIES BROUGHT BY TRANSPORT.

Nil.

## INFANTILE MORTALITY RATE—IPOH.

Year.					Births.			Deaths.			Rate per mille.
1916	...	...	...	...	725	...	...	126	...	...	173.79
1917	...	...	...	...	881	...	...	168	...	...	190.00
1918	...	...	...	...	843	...	...	173	...	...	205.22
1919	...	...	...	...	792	...	...	137	...	...	173.00
1920	...	...	...	...	866	...	...	137	...	...	158.19
1921	...	...	...	...	898	...	...	155	...	...	172.61
1922	...	...	...	...	974	...	...	152	...	...	156.05
1923	...	...	...	...	904	...	...	119	...	...	131.64
1924	...	...	...	...	1,072	...	...	126	...	...	117.54
1925	...	...	...	...	844	...	...	120	...	...	142.18
1926	...	...	...	...	1,364	...	...	131	...	...	96.04
1927	...	...	...	...	1,650	...	...	140	...	...	84.85

## MATERNAL AND CHILD WELFARE WORK DONE DURING THE YEAR.

Nature of work.										Total.
Number of Clinics held	...	...	...	...	...	...	...	...	...	539
Number of mothers seen by doctor ante-natal	...	...	...	...	...	...	...	...	...	276
Number of mothers seen by doctor post-natal	...	...	...	...	...	...	...	...	...	221
Number of babies on birth register during year	...	...	...	...	...	...	...	...	...	1,321
Number of babies under one year seen by doctor	...	...	...	...	...	...	...	...	...	1,172
Number of babies weighed	...	...	...	...	...	...	...	...	...	1,116
Children normal general advice given	...	...	...	...	...	...	...	...	...	3,308
Suffering from incorrect feeding	...	...	...	...	...	...	...	...	...	305
Suffering from worms	...	...	...	...	...	...	...	...	...	5,011
Suffering from malaria	...	...	...	...	...	...	...	...	...	1,149
Referred to hospital	...	...	...	...	...	...	...	...	...	588

## VISITS BY NURSES.

To expectant mothers	...	...	...	...	...	...	...	...	542
To infants under one year	...	...	...	...	...	...	...	...	5,770
To children 1-12 years	...	...	...	...	...	...	...	...	8,118
Total visits by Sisters	...	...	...	...	...	...	...	...	11,742
Total visits by Nurses	...	...	...	...	...	...	...	...	14,430
Number of mothers and babies brought by transport	...	...	...	...	...	...	...	...	Nil
Visits paid to Gopeng Dispensary once a week	...	...	...	...	...	...	...	...	—

IPOH,  
13th January, 1928.

L. J. BENTINCK,  
*Lady Medical Officer,  
Infant Welfare Centre, Ipoh.*

MATERNITY AND CHILD WELFARE WORK DONE AT THE INFANT WELFARE  
CENTRE, IPOH, ANNUAL REPORT OF 1927.

Nature of work.			Monthly Total of Nationalities.	
			New cases.	Repeat cases.
1. Total No. of Clinics held ... ..	539	MALAYS—		
2. „ Attendances of Mothers...	2,880			
3. „ Attendances of Infants up to one year ... ..	2,726	Infants ... ..	123	202
4. „ Attendances of Children from 1 to 12 years ... ..	9,172	Children ... ..	512	466
5. „ Attendances of other cases ... ..	2,008	Women ... ..	274	172
6. Grand Total of Attendances ... ..	16,796			
7. No. of New Infants attended ... ..	1,349	Total ... ..	909	840
8. „ Children „ ... ..	5,789			
9. „ Mothers „ ... ..	2,042			
10. „ Other cases seen ... ..	1,347			
11. No. of Infants—Normal, general advice given ... ..	2,375			
12. No. of Children—Normal, general advice given ... ..	933	CHINESE—		
13. No. of Infants suffering from incorrect feeding ... ..	305	Infants ... ..	787	840
14. No. of Infants suffering from malnutrition ... ..	4	Children ... ..	2,886	1,837
15. No. of Infants suffering from congenital syphilis ... ..	3	Women ... ..	1,656	984
16. No. of Infants suffering from rickets	—			
17. No. of Cases of Worms—		Total ... ..	5,329	3,661
(a) Women ... ..	588			
(b) Children ... ..	4,423			
18. No. of Cases of Malaria—				
(a) Women ... ..	321			
(b) Children ... ..	828			
19. No. of Cases of Beri-beri—		TAMILS—		
(a) Women ... ..	12			
(b) Children ... ..	—			
20. No. of Cases of Other Diseases—		Infants ... ..	435	302
(a) Women ... ..	3,575	Children ... ..	2,352	942
(b) Children ... ..	2,884	Women ... ..	1,423	419
21. No. of Ante-Natal Mothers seen by Doctor ... ..	276			
22. No. of Post-Natal Mothers seen by Doctor ... ..	221	Total ... ..	4,210	1,663
23. No. of Mothers (Others) seen by Doctor ... ..	2,321			
24. No. of Infants seen by Doctor ... ..	1,172			
25. „ Children seen by Doctor ... ..	3,846			
26. „ Infants weighed ... ..	1,116			
27. „ Cases referred to Private Doctors	—			
28. „ „ Sent to Hospital... ..	588	OTHERS—		
		Infants ... ..	14	23
29. No. of Visits paid by Sisters to—		Children ... ..	39	38
(a) Expectant Mothers ... ..	471	Women ... ..	36	24
(b) Infants... ..	4,670			
(c) Children aged 1 to 12 years ... ..	6,601	Total ... ..	89	85
30. No. of Visits paid by Health Visitors to—				
(a) Expectant Mothers ... ..	542			
(b) Infants ... ..	5,770			
(c) Children aged 1 to 12 years ... ..	8,118			
31. No. of patients brought by transport...	—	GRAND TOTAL ... ..	10,547	6,249

NOTE.—A post-natal mother is one requiring an examination within a month or six weeks after labour with a view to detecting if unobserved injury has resulted from her confinement.



## APPENDIX Q.

ANNUAL REPORT OF THE INFANT WELFARE CENTRE AND CLINIC  
FOR MOTHERS, TAIPING, FOR THE YEAR 1927.

## STAFF.

One Lady Medical Officer (part time).  
 One European Nursing Sister.  
 Two health visitors.  
 One female attendant.  
 One messenger.  
 One punkah-puller.

Dispensing is done by the dresser-in-charge of the Town Dispensary, assisted by an attendant.

Microscopical and clinical examinations are made at the General Hospital Laboratory.

## PREMISES.

These consist of a shop-house. Besides a small entrance space and passage, there are three rooms.

- (1) A small cubicle downstairs, where minor dressings are done.
- (2) A large room, upstairs, used for waiting, general and exhibition room as well as for my office.
- (3) A small room reserved for examination of patients, when privacy is indicated.

## CHANGES IN THE STAFF.

There have been two additions to the staff.

- (1) A probationer clerk Mr. Goh Hun Chuan was appointed on 7th April, 1927, and was superseded by a Grade III clerk Mr. Dewan Chand on 15th May, 1927.
- (2) A messenger was appointed on 1st March, 1927.

## THE WORK.

There has been a very great increase in the total amount of Infant Welfare work dealt with this past year.

Grand total for year 1927	...	...	...	...	...	28,061
"          "          1926	...	...	...	...	...	18,242

The infant attendances are 1,662 more than during last year.

Total infant attendances during 1927	...	...	...	...	6,400
"          "          1926	...	...	...	...	4,768
"          "          1925	...	...	...	...	3,946

Hitherto I have found mothers quite willing to come monthly to weigh their babies, but distances are comparatively great and women grudge the time for more frequent visits, if the children seem well. The average attendance per child per year works out at 8.5, though in actual fact the majority have made their full 12 visits and the low figure is produced by those who might be termed "conscientious objectors" or by actual defaulters. The acquisition of the motor bus in 1928 may enable us to have these babies up more frequently in future.

It is still a great and unsuccessful struggle to keep the Clinic strictly to infant and maternal welfare work. Nevertheless the infants up to one year form over 56 per cent. of the attendances and children aged 1 to 12 years over 26 per cent., thus over 82 per cent. of the attendances at the Clinic are children.

As I do not have a separate declared out-patient department at the hospital, I usually feel bound to see patients when they present themselves at the Welfare Centre. Otherwise it means them waiting for hours at the hospital or making a journey the next day. It is becoming much less difficult to get the women to go into hospital for treatment of anaemia and other more or less chronic complaints.

There is a very great deal of dental caries and though many women are consenting to use the individual tooth brush with its ritual, yet the need for a dental clinic is great and urgent.

## THE ANTE-NATAL CLINIC.

This is still far from satisfactory, although a few women have attended faithfully and a number have accepted necessary treatment either at the Venereal Diseases Clinic or in hospital with the usual satisfactory results.

Still, on the whole, women are "too busy", or "cannot afford the rickshaw fare" to attend the Clinic, unless they are really ill. They usually cannot or will not afford a trained midwife and bring forward all the old excuses against going into hospital either for treatment before confinement or for the confinement itself.

## HEALTH VISITING.

There has been great progress in the home visiting this year, in spite of much that has been against the work. The Sister cannot spend her entire time visiting; of the two health visitors, one visits and one stays in the Centre, in turns. Casual leave reduces the staff during six weeks in the year.

Visits made 1927	...	...	...	13,371	(1 Sister and 2 health visitors)
„ 1926	...	...	...	4,391	(1 Sister and 1 health visitor, except for about three months)

It is on these visits that the most useful teaching is done. Practical help with the establishment of breast feeding, correcting faulty artificial feeding, sunning and airing rooms, little talks on dirt and disease and feeding seem much simpler and understandable than lectures, either individual or to a larger number of people at the Centre. The ante-natal cases appreciate these visits very much and are much more apt to heed the advice given them on these occasions.

One thing I am very pleased to report this year is the steadily decreasing number of old tins used as "feeding bottles" and of long tube bottles.

## WORK AMONG THE MALAYS.

Consultations held at various points within fairly easy reach of Malay kampongs have helped us to see more Malays. Even so, distances are great and though I have had a hired car to bring the mothers and babies to the Centre for consultations, the walk from the house to the car is quite difficult and often impossible owing to the very heavy rains and miniature floods which occur with such frequency in the district.

Appended are the figures for the year taken from the monthly returns.

TAIPING,  
18th January, 1928.

EVELYN B. JACQUES,  
Lady Medical Officer,  
Infant Welfare Centre, Taiping.



MATERNITY AND CHILD WELFARE WORK DONE AT THE INFANT WELFARE  
CENTRE, TAIPING, DURING THE YEAR 1927.

Nature of work.			Monthly Total of Nationalities.	
			New cases.	Repeat cases.
1. Total No. of Clinics held ... ..	541	MALAYS—		
2. „ Attendances of Mothers...	350			
3. „ Attendances of Infants up to one year ... ..	8,265	Infants ... ..	410	855
4. „ Attendances of Children from 1 to 12 years ... ..	3,874	Children ... ..	314	155
5. „ Attendances of Other cases ... ..	2,201	Women ... ..	201	72
6. Grand Total of Attendances ... ..	—			
7. No. of New Infants attended ... ..	2,510	Total ... ..	925	1,082
8. „ Children „ ... ..	2,702			
9. „ Mothers „ ... ..	512			
10. „ Other cases seen ... ..	2,457			
11. No. of Infants—Normal, general advice given ... ..	5,610			
12. No. of Children—Normal, general advice given ... ..	406	CHINESE—		
13. No. of Infants suffering from incorrect feeding ... ..	153	Infants ... ..	1,822	3,669
14. No. of Infants suffering from malnutrition ... ..	25	Children ... ..	1,403	761
15. No. of Infants suffering from congenital syphilis ... ..	22	Women ... ..	758	429
16. No. of Infants suffering from rickets	2			
17. No. of Cases of Worms—		Total ... ..	3,983	4,859
(a) Women ... ..	389			
(b) Children ... ..	1,423			
18. No. of Cases of Malaria—				
(a) Women ... ..	115			
(b) Children ... ..	322			
19. No. of Cases of Beri-beri—		TAMILS—		
(a) Women ... ..	—			
(b) Children ... ..	—			
20. No. of Cases of Other Diseases—		Infants ... ..	581	728
(a) Women ... ..	1,868	Children ... ..	907	282
(b) Children ... ..	3,809	Women ... ..	813	178
21. No. of Ante-Natal Mothers seen by Doctor ... ..	200			
22. No. of Post-Natal Mothers seen by Doctor ... ..	64	Total ... ..	2,301	1,188
23. No. of Mothers (Others) seen by Doctor ... ..	55			
24. No. of Infants seen by Doctor ... ..	2,529			
25. „ Children seen by Doctor ... ..	3,655			
26. „ Infants weighed ... ..	6,400			
27. „ Cases referred to Private Doctors	—			
28. „ „ Sent to Hospital ... ..	84	OTHERS—		
		Infants ... ..	69	139
		Children ... ..	65	27
		Women ... ..	36	16
		Total ... ..	170	182
		GRAND TOTAL...	7,379	7,311

NOTE.—A post-natal mother is one requiring an examination within a month or six weeks after labour with a view to detecting if unobserved injury has resulted from her confinement.

## RECORD OF ATTENDANCES, INFANT WELFARE CENTRE, TAIPING.

		Up to 1 year.		1-12.		Women.		Total, 1927.		Total health visiting, 1927.
January	...	596	...	319	...	190	...	1,105	...	730
February	...	544	...	287	...	188	...	1,019	...	963
March	...	678	...	417	...	206	...	1,301	...	1,289
April	...	612	...	287	...	211	...	1,110	...	1,094
May	...	629	...	351	...	197	...	1,177	...	1,183
June	...	567	...	282	...	166	...	1,015	...	952
July	...	506	...	261	...	237	...	1,004	...	1,166
August	...	612	...	236	...	173	...	1,021	...	1,204
September	...	823	...	331	...	218	...	1,372	...	1,174
October	...	917	...	358	...	268	...	1,543	...	1,316
November	...	1,025	...	443	...	335	...	1,803	...	1,289
December	...	756	...	302	...	162	...	1,220	...	1,011
Total		8,265	...	3,874	...	2,551	...	14,690	...	13,371
									28,061	



CASES BY NATIONALITIES.

		Chinese .			Indians.			Malays.			Others.			Grand Total.			
		Clinic.	District.	Total.	Clinic.	District.	Total.	Clinic.	District.	Total.	Clinic.	District.	Total.				
January	...	...	...	...	727	480	1,207	267	122	389	75	86	161	36	42	78	1,835
February	...	...	...	...	633	586	1,219	265	211	476	92	78	170	29	88	117	1,982
March	...	...	...	...	818	781	1,599	323	290	613	122	146	268	38	72	110	2,590
April ...	...	...	...	...	708	612	1,320	270	286	556	106	123	229	26	73	99	2,204
May ...	...	...	...	...	701	633	1,334	243	313	556	198	179	377	35	58	93	2,360
June ...	...	...	...	...	585	654	1,239	244	145	389	149	141	290	37	12	49	1,967
July ...	...	...	...	...	605	836	1,441	251	203	454	109	98	207	39	29	68	2,170
August	...	...	...	...	625	822	1,447	213	230	443	123	111	234	60	41	101	2,225
September	...	...	...	...	859	730	1,589	350	153	503	148	264	412	15	27	42	2,546
October	...	...	...	...	847	609	1,456	365	215	580	311	400	711	20	92	112	2,859
November	...	...	...	...	973	614	1,587	462	193	655	360	360	720	8	122	130	3,092
December	...	...	...	...	761	420	1,181	236	273	509	214	260	474	9	58	67	2,231
Total, 1927				...	8,842	7,777	16,619	3,489	2,634	6,123	2,007	2,246	4,253	352	714	1,066	28,061
Total, 1926				..	...	...	11,623	...	...	4,280	...	...	1,811	...	...	528	18,242

					1927.		1926.
(1) Ante-natal Clinic	...	...	...	...	350	...	135
(2) Babies on register	...	...	...	...	748	...	520
(3) Babies weighed—							
January	...	...	...	...	457	...	504
February	...	...	...	...	345	...	290
March	...	...	...	...	516	...	507
April	...	...	...	...	462	...	338
May	...	...	...	...	517	...	266
June	...	...	...	...	509	...	367
July	...	...	...	...	587	...	465
August	...	...	...	...	582	...	351
September	...	...	...	...	536	...	405
October	...	...	...	...	579	...	414
November	...	...	...	...	676	...	468
December	...	...	...	...	634	...	393
				Total	...	6,400	4,768
(4) Health Visiting—							
Primary visits to infants	...	...	...	...	663	...	754
Subsequent visits to children under 1 year	...	...	...	...	4,614	...	2,718
Visits to children 1 to 1-12	...	...	...	...	7,262	...	791
Visits to ante-natal cases	...	...	...	...	832	...	128
				Total	...	13,371	4,391





